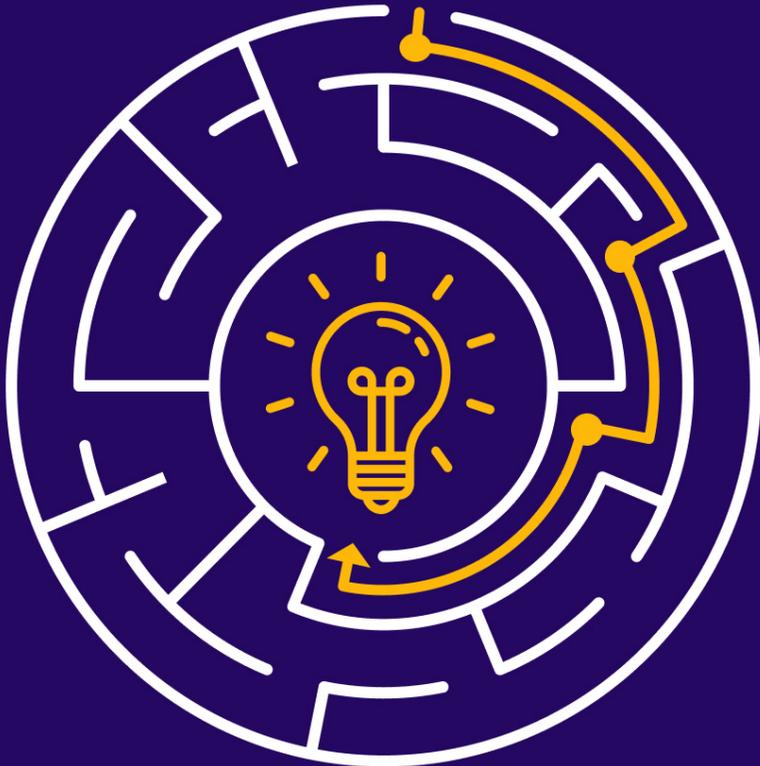


SECOND EDITION

Understanding Power Purchase Agreements



Understanding Power Purchase Agreements – Second Edition

Published Under the Creative Commons
Attribution-Noncommercial-Share Alike 4.0
International License (CC BY NC SA)

Understanding Power Purchase Agreements

Second Edition



UNITED STATES DEPARTMENT OF COMMERCE
The Secretary of Commerce
Washington, D.C. 20230

Since 2013, the U.S. Government's Power Africa initiative has sought to marshal technical, legal, and financial resources to support the goal of doubling access to electricity in sub-Saharan Africa. Through a substantial network of partners in the public and private sectors, Power Africa is working alongside dozens of African governments to facilitate the development of power projects on a scale that will meet the continent's power deficit. I am particularly proud of the leading role the U.S. private sector plays in this development effort. I consider Power Africa to represent one of the best models for collaborations between the U.S. Government and the private sector for achieving positive commercial and policy outcomes.

One of the most important aspects of Power Africa is how it facilitates the free exchange of information between public and private sector partners. As part of this effort, Power Africa has developed a series of open-source handbooks to establish a common understanding of best practices for successful power project development. The *Understanding* series now includes a total of five handbooks, with 55,000 copies in print and tens of thousands more copies downloaded online. It is my honor to present this update to the first handbook that launched the entire series: *Understanding Power Purchase Agreements*. In keeping with Power Africa's focus on accessibility, the newest edition of the handbook continues a focus on plain-language explanations and includes new chapters on some of the most innovative trends in today's power market.

As with its previous editions, the development of this handbook, which was coordinated by the U.S. Department of Commerce's Commercial Law Development Program (CLDP) and the African Development Bank's African Legal Support Facility (ALSF), was a consultative process involving U.S. Government agencies, African governments, multilateral institutions, and private-sector stakeholders. It is notable that all the authors were volunteers and that they collectively contributed more than 1,000 hours over the course of five (long) days to produce a resource that reflects their collective expertise and experience. I am deeply grateful for their contributions and for the essential role the U.S. Department of Commerce played in developing and delivering this resource to readers around the world.

Sincerely,

A handwritten signature in black ink that reads "Wilbur Ross".

Wilbur Ross
U.S. Secretary of Commerce

C O N T E N T S

1. FOREWORD

2. INTRODUCTION

3. POWER PROJECTS IN CONTEXT

3.1. Introduction	18
3.2. Power Generation Markets	19
3.3. Enabling Private Investment	30
3.4. Procurement of Electricity	34
3.5. Environmental and Social Requirements	37
3.6. Summary of Key Points	41

4. THE POWER PURCHASE AGREEMENT

4.1. Introduction	44
4.2. Origins of a PPA	45
4.3. Crafting the PPA	51
4.4. Memoranda of Understanding (MoUs)	54
4.5. Related Project Agreements	58
4.6. Timing Considerations	61
4.7. Summary of Key Points	65

5. FINANCING OF POWER PROJECTS

5.1. Introduction	68
5.2. Project Finance	69
5.3. Bankability	76
5.4. Credit Support for Offtaker Obligations	83
5.5. PPA Direct Agreements	87
5.6. Summary of Key Points	89

6. FINANCIAL PROVISIONS

6.1. Introduction	92
6.2. Tariff Structures	93
6.3. Invoicing and Payments	112
6.4. Tax Exemptions	114
6.5. Summary of Key Points	116

7. RISK ALLOCATION AND MITIGATION

7.1. Introduction	118
7.2. Development and Construction Phase Risks	120
7.3. Operational Phase Risks	132
7.4. Foreign Exchange	144
7.5. Other Risks	149
7.6. Force Majeure	159
7.7. Insurance	163
7.8. Summary of Key Points	165

8. DEFAULT AND TERMINATION

8.1. Introduction	168
8.2. Types of Defaults	169
8.3. Notice, Cure Periods and Lender Rights	174
8.4. Non-default Events	179
8.5. Post-Termination Obligations	180
8.6. Summary of Key Points	189

9. OTHER PPA PROVISIONS

9.1. Introduction	192
9.2. Resolving Disputes	193
9.3. Local Content and Ownership	199
9.4. Expiration of the PPA	203
9.5. Confidentiality	205
9.6. Boilerplate Provisions	206
9.7. Summary of Key Points	208

10. OTHER TYPES OF PPAS

10.1. Introduction	210
10.2. Captive Power	211
10.3. Cross Border Power	214
10.4. Emergency Power	218
10.5. Summary of Key Points	221

Glossary	222
Acronyms	234
Other Resources	238

Foreword

Electricity drives the engine of progress in the modern world. It boosts productivity by extending the window of opportunity for work and study. It powers the innovation in our factories. From telecommunications to transportation, power is essential to virtually every aspect of our increasingly dynamic and interconnected world. As a result, investment in power infrastructure must be a part of any strategy for economic development. This is true for both broad economic growth initiatives in emerging countries and targeted rural growth initiatives in developed countries.

The transformational nature of power projects does, however, come with risks. Given that power projects are most essential where there is a power shortage in the market, these projects often represent a pioneering level of investment and financial complexity in these markets. As a result, it has become standard practice to adopt a durable agreement that cements the predictability and durability that is needed for any long-term business venture. Such an agreement is called the Power Purchase Agreement (PPA) and these agreements have helped to drive the growth and development of independent power projects around the world.

This handbook is intended to provide an overview of PPAs and the obligations, risks, and remedies that are found within them. Our group of authors, who each contributed their time on a pro-bono basis, includes contributors from governments, development banks, private banks and leading international law firms. Our hope is that by providing perspectives from all sides of the PPA negotiation process, we can present the reader with a balanced understanding of the challenges involved in PPAs and an insight into the practical reality of overcoming such challenges when negotiating these complex agreements. More than anything, we want to communicate to the reader that the key to a successful PPA is to abandon the assumption of an adversarial process and to adopt instead a strategy of cooperation and coordination. It is only through this balanced approach

FOREWORD

that the risks can be mitigated and the rewards realised for all parties involved. This second edition of the handbook includes additional insight and case studies on the negotiation of power purchase agreements for both small and large-scale projects, along with new guidance on emerging issues in the power markets such as commercial and industrial power purchase agreements and crossborder agreements.

The handbook was produced using the Book Sprint (<http://www.booksprint.net/>) method which allows for the drafting, editing, and publishing of a complete product in just five days. Our journey began with a spirited discourse and quickly progressed to a furious pace of writing with occasional interruptions for the introduction of brilliant ideas and critical insights. There was a surprising amount of consensus on some topics and an unexpected level of debate on others. The outcome is a product that reflects this teamwork rather than the personal opinions of the authors or the institutions that they represent.

The authors would like to thank our Book Sprint facilitator Barbara Rühling for her patient guidance and unwavering leadership. The authors would also like to thank Henrik van Leeuwen and Lennart Wolfert for turning our rushed scribbles into beautiful and meaningful illustrations. The tireless work of BookSprints' remote staff Raewyn Whyte (proofreader), Julien Taquet and Katerina Michailidi (Technical Support), should also be recognised. Considerable planning and development went into the conceptualisation of the power project procurement handbook. The authors would like to recognize the following individuals and institutions that helped focus dialogue to build a consensus around the need for this handbook: Megan Taylor (Power Africa); Toyin Ojo (African Legal Support Facility); and Joe Yang (Commercial Law Development Program). The authors would also like to thank the generous funding and logistics support from the United States Agency for International Development's Power Africa program and the African Legal Support Facility.

FOREWORD

To continue the tradition of open-source knowledge sharing that is at the core of the Power Africa Understanding series, this handbook is intended to reflect the vibrant nature of the Book Sprint process and serve not simply as a reference but also as a jumping-off point for further discussion and scholarship. The handbook is issued under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License (CC BY NO SA). In selecting this publication license, anyone is welcome to copy, excerpt, rework, translate and re-use the text for any non-commercial purpose without seeking permission from the authors, so long as the resulting work is also issued under a Creative Commons License. The handbook is initially published in English with French, Portuguese and Spanish editions soon to follow. The handbook is available in electronic format at <http://cldp.doc.gov/Understanding> as well as in print format. It can be used as an online interactive resource. Many of the contributing authors are also committed to working within their institutions to adapt this handbook for use as the basis for training courses and technical assistance initiatives.

Bringing electricity to underserved communities is a rare example of a universally-held ambition in a world filled with competing development priorities. Governments, private companies, private banks, and development institutions are all working tirelessly towards the goal of electrification. If this handbook can in any way move us towards the shared goal of greater energy access, then we will consider it an unqualified success.

The authors of this second edition would like to acknowledge and thank the contributions of the authors of the first edition of this handbook, including Mahib Cisse, Chief Investment Officer, African Development Bank (Côte D'Ivoire); Patrick M. Dougherty, Senior Counsel, The World Bank (United States); Allen B. Leuta, (formerly) Head – Legal, Africa Standard Bank (South Africa); Anastas P. Mbawala, Director of Electricity, Energy and Water Utilities Regulatory Authority (Tanzania); Eluma Obibuaku, Vice President – Power, African Finance Corporation (Nigeria); Michael Tam, Partner, Berwin Leighton Paisner LLP (Hong Kong); Tim

FOREWORD

Scales, Partner, Allen & Overy LLP (United Kingdom/France); Amir Shaikh (formerly) Chief Legal Counsel, African Legal Support Facility (Côte D'Ivoire); and Toyin Ojo, Senior Legal Counsel, African Legal Support Facility (Côte D'Ivoire).

Sincerely,
The Contributing Authors

Mohamed Badissy
Assistant Professor
Penn State Dickinson Law
(United States)

Nnaemeka Ewelukwa
Managing Director/Chief Executive Officer
Nigerian Bulk Electricity Trading PLC
(Nigeria)

Ryan T. Ketchum
Partner
Hunton & Williams LLP
(United Kingdom)

Mohammed Loraoui
Attorney-Advisor
U.S. Department of Commerce
(United States)

Gadi Taj Ndahumba
Head of Power Sector
African Legal Support Facility (ALSF)
(Côte D'Ivoire)

Omar Vajeth
Investment Officer
African Development Bank
(South Africa)

Alex Evans
Associate General Counsel
U.S. International Development Finance Corporation
(United States)

Jay Govender
Director & Head, Projects and Energy Sector
Cliffe Dekker Hofmeyr Inc.
(South Africa)

Charles Liebenberg
Chief Financial Officer
AMEA Power
(UAE)

Subha Nagarajan
Managing Director, GCA
Energy Financial Services - GE Capital
(United States)

Justin Pavry
Deputy Chief Legal Officer, Debt & Project Finance
CDC Group plc
(United Kingdom)

Introduction

The Power Purchase Agreement (PPA) is the central contract for any independent power generation project, but can be especially critical in emerging markets. Although a prerequisite to the success of a power project, the PPA is only one aspect of a power sector transaction. Prior to any attempt to attract capital to a country, the host government and offtaker should work towards creating an enabling environment. This usually includes extensive load and demand forecasts, ensuring that adequate transmission infrastructure is available or planned and establishing a predictable and stable regulatory environment favouring clear and transparent procurement processes.

In our current world of limited public and concessional capital, governments and utilities choosing the project finance route will have to carefully consider the demands of the sponsors and of the lenders. It is essential to understand their key concerns to avoid the failure of the project.

The PPA being the agreement that defines the cash flow structure of a project, it will be central to the bankability of a transaction. It also means that the offtaker's creditworthiness will be a primary focus of the lender's credit analysis of the project. Therefore, lenders may require that credit enhancement instruments such as government guarantees be structured into the transaction to mitigate the risks affecting the revenue stream.

An adequate allocation of risks generally and within the termination regime in particular, are also key to ensure the success of the project. When negotiating a PPA, risks such as delay in construction, currency convertibility and transferability, and political and natural force majeure need to be appropriately allocated. The parties should and will negotiate the termination payments, but there are strong market practices setting the customary consequences of defaults under a PPA in a project finance scenario. It is therefore important to be aware of market expectations, in

order to remain within the range of contractual outcomes that can be accepted by the sponsors and lenders while attempting to negotiate the best deal for oneself.

Who is this handbook for?

This handbook is primarily intended as a practical resource for government officials who are involved in the drafting and negotiating of PPAs. It sets out the context and key considerations in the preparation of a PPA, focusing particularly on the most significant clauses. This handbook represents the collective wisdom of a broad cross-section of practitioners who have been engaged in power project development around the world for decades.

At its essence, the goal of this handbook is to provide the reader with an insight not only into those issues that matter most to them, but also a glimpse into the perspectives and motivations of other stakeholders. Often, the most effective means of reaching agreement is putting yourself in the other party's shoes. Such insight can make reaching agreement a far simpler task.

What is the scope of this handbook?

Over the past few years since the publication of the first edition of this handbook, the power market in Africa is facing new emerging issues. Understanding Power Purchase Agreements focuses on the mechanics and specifics of a Power Purchase Agreement (PPA). This latest edition includes additional insight and case studies on the negotiation of PPAs for both small- and large-scale projects, along with new guidance on emerging issues such as commercial and industrial PPAs, cross-border PPAs and renewables.

The other handbooks within the Understanding series include the Understanding Power Project Financing handbook, which focuses on the financing structures and mechanisms that can be employed to finance privately-owned independent power projects. The Understanding Natural Gas and LNG Options handbook was developed by the U.S. Department of

INTRODUCTION

Energy and is an in-depth guide on upstream and downstream development of natural gas. The Understanding Power Project Procurement handbook explores the complexity of procuring privately-owned power projects.

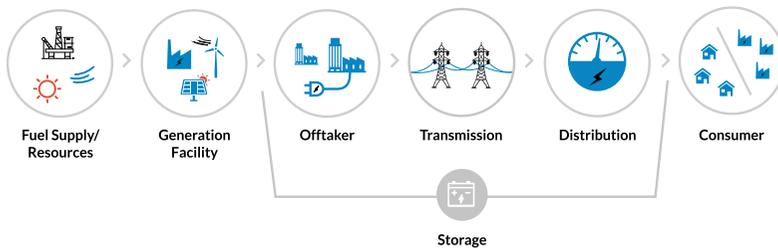
3. Power Projects in Context

3.1. Introduction

This chapter provides an overview of how our homes and businesses are supplied with the electricity generated by power plants. It highlights the different types of power generation facilities and explains how electricity is bought and sold. It also explains the different players who are involved in the power generation market and the lifecycle of a power plant.

3.2. Power Generation Markets

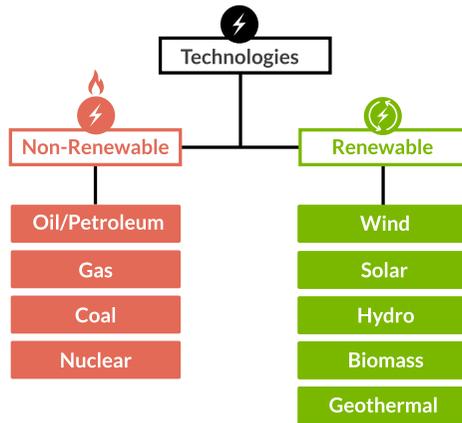
The diagram below highlights the different segments of the power market. Those segments are: (a) power generation, (b) power transmission, and (c) power distribution. Power generation is the process of generating electrical energy from various sources of primary energy. Transmission is the movement of this energy at high voltage over long distances from producers to distribution or supply companies. Distribution companies then transport the energy over distribution networks to deliver the energy to domestic and commercial consumers.



Types of Power Generation

Electricity may be generated by renewable resources (such as wind, solar, hydroelectric, biomass and geothermal resources) or from non-renewable resources (such as petroleum, natural gas, coal and nuclear). Power plants that generate electricity from non-renewable fuels (other than nuclear power plants) are generally referred to as thermal power plants.

3. POWER PROJECTS IN CONTEXT



For the purposes of this handbook, many of the issues discussed will apply to power plants that generate electricity from both renewable and non-renewable resources. When possible, the handbook will note different considerations that may be required in relation to the fuel type. While nuclear power is also a potential source of power, due to its complexity and the degree of specialisation required, it is not included within the scope of this handbook.

There are a number of information resources detailing differences in the types of technologies used in power generation. These differences are important. Each technology will have different implications for the structure of the power purchase agreement (PPA) and the prices paid. A PPA is a contract between two parties, one who produces or generates power for sale (the seller) and one who seeks to purchase power (the offtaker). This contract is sometimes referred to as an offtaker agreement. Information about some of these technologies can be found in the list of additional resources at the end of this handbook.

Wholesale and Retail Markets

There is a distinction between the bulk power purchase market and the retail electricity purchase market. Power is purchased in bulk by offtakers (buyers) from the power producer at or near the point of generation. This power is then transmitted through transmission lines and distribution systems to domestic and commercial consumers in the retail electricity market.

How much energy can a power plant produce?

Power generation plants are measured by the number of megawatts (**MW**) that they are capable of producing. A megawatt is a unit of measurement equal to 1,000 kilowatts. A kilowatt (**kW**) is equal to 1,000 watts of energy.

How is power bought and sold?

A kilowatt hour (**kWh**) is equal to 1,000,000 watts (or 1,000 kilowatts) of electricity used continuously for one hour. Similarly, a megawatt hour (**MWh**) is equal to 1,000 kilowatts of electricity used continuously for one hour. Capacity is purchased and sold in MW and in many cases is paid for regardless of whether the capacity is actually used. Energy is purchased and sold in MWh or kWh and is paid for only when consumed.

What does this all mean?

Here is a brief example: If a power generation plant is rated as having a capacity of 10 MW, it can be expected to generate up to 10 MW of power at any given time. If a 10 MW plant is operating at full capacity at a steady

rate for 1 hour, it will produce 10 MWh (10,000 kWh) of electricity. If the tariff is US\$0.10 per kWh, the plant can generate power to the value of US\$1,000 for every hour that it operates.

How does power get from the power plant to consumers?

Responsibility for transmitting power to, and interconnecting with, the power grid will vary from jurisdiction to jurisdiction, depending on whether the system in which the system operates is a bundled or unbundled system."

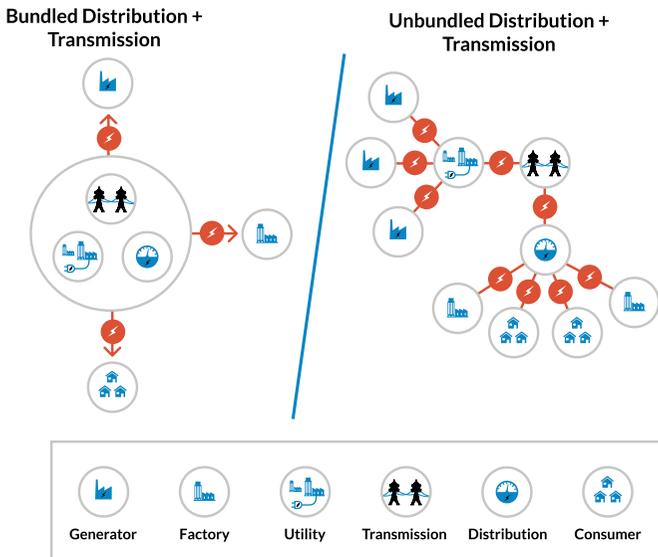
What's the difference between bundled and unbundled electricity industry structures?

Depending on the legal and regulatory frameworks and the nature of the electricity market reforms taking place in a country, there are typically two different types of electricity industry structures, bundled and unbundled.

A bundled system comprises one in which the market roles of power purchasing, transmission and distribution are "bundled" into one entity: the offtaker. In a bundled system, the offtaker usually bears responsibility for transmitting the power that is produced and sold by the seller. Additionally, the offtaker in this system will have the obligation to connect the power plant with the power grid by a certain date so that power can be sold when it is ready.

An unbundled system is where one or more of these roles is not the responsibility of the offtaker, but is handled by a different entity. The extent of this separation is dependent on the specific electricity reform path adopted in a particular jurisdiction.

3.2. POWER GENERATION MARKETS



Why is all this relevant? It matters because of the number of parties involved in each system. The more parties involved in the system, the greater the risk which has to be appropriately allocated amongst the parties. This will impact on how the project is structured and where the risks may reside.

It should be noted that the electricity structure in different countries may not fit neatly into the above mentioned categories. Depending on the reform path that has been adopted, there are usually different stages in the development of a power market, often starting with a single government offtaker, moving towards a greater role for independent power producers, investor-owned utilities, and other private sector participants. Broadly, the goal may be to progressively move from a monopolistic industry structure to a more competitive market, with consumers gradually having an increased choice of suppliers. This transition is often facilitated by a

regulatory body established as part of the reform process. Eventually, a **spot market** could develop, where the project company in a power pool can sell power at the current market price, without a fixed contract.

In some jurisdictions, there may be hybrid market arrangements where producers with PPAs may still have the right or obligation to sell to the spot markets.

Roles of the Actors

Who are the various people, the *actors*, involved in the negotiation of a PPA, and what are their primary roles?

Primary actors

- Offtaker (buyer)
- Project company (seller)

Secondary actors

- Host government
- Regulator
- Consumers
- Transmission company
- Distribution company
- Lenders
- Construction company (EPC contractor)
- Plant operator
- Fuel supplier
- System operator

The primary actors are usually an offtaker and a project company. Depending on the legal and regulatory context, some of the secondary actors may also be signatories to the PPA.

Primary actors

Project company (seller)

The project company is the owner of the power project and the seller of power. This party is also sometimes referred to as the independent power producer (IPP), power developer or generator.

Offtaker (buyer)

The offtaker or power purchaser is the buyer of power. This will usually be a utility, which is often state-owned.

Secondary actors

Host government

The host country government is often involved in various phases of the negotiation of the PPA. The role of the government varies widely, based on each country's legal and regulatory framework.

The primary government actor involved is usually the ministry of energy which sets policy for the energy sector of the host country. Other government actors involved may include the ministries of finance and planning, investment promotion agencies, the central bank, revenue authorities, the ministry of environment or natural resources, the ministry of land, the ministry of archaeology, the attorney general, and the legislature.

Regulator

Electricity sector regulators are usually required to approve any PPA before the offtaker can enter into the agreement. The regulator is responsible for setting or approving tariffs and ensuring that industry standards are complied with across the market. Regulation often involves a delicate balancing act of protecting consumer interest, while also ensuring that IPPs are reasonably incentivised to develop power projects in a country.

Consumers

Although not party to a PPA, small voltage consumers are certainly affected by the PPA, as the costs of building and operating the power plant will (or should) ultimately be passed through to the consumers through the retail tariffs (or, in other words, the price) charged to the power users.

High-voltage consumers may negotiate a PPA directly with the seller if they are taking power directly from the seller.

Transmission companies

Transmission companies are responsible for moving the power generated by the seller at high voltage to the country's distribution networks. In a bundled framework, this will generally be the same entity as the offtaker.

In an unbundled framework, depending on the nature of unbundling, as discussed above, the transmission company may or may not be directly involved in the PPA negotiations.

Distribution companies

Distribution companies are responsible for delivering the power to the consumer and collecting the tariff. In a bundled framework, the offtaker may also be responsible for distribution.

Lenders

Independent power producers are rarely able to finance 100% of the project costs alone. IPPs will usually borrow money from lenders to finance power projects. The lenders are often actively involved in the PPA negotiations. If the PPA is not acceptable to the lenders, it may have to be renegotiated before the lenders agree to make their loans.

There are several types of lenders. There are commercial banks that are lending primarily for commercial returns. DFIs lend for commercial return

and developmental impact. DFIs can be multi-lateral or bilateral; they can have several countries as their members or have just one country as their owner. Export credit agencies often provide financing for equipment.

Fuel supplier

This is the company that supplies fuel to the power plant, usually for a thermal power plant under a long-term agreement that is fixed in respect of volume (calorific/energy value) and price, or at the very least by way of the price determination formula.

Construction company (EPC contractor)

The construction company is responsible for building the plant to the specifications that are agreed with the project company to ensure that the project company can meet its output/capacity obligations as defined in the PPA.

Plant operator

The plant operator is responsible for ensuring that the plant is operated and maintained in accordance with the project company's obligations under the PPA.

System operator

The system operator manages the operation of the electricity grid.

Lifecycle of a Power Generation Project

The following graphic provides an overview of a power generation project including the preparation, procurement/negotiation, construction, and implementation. The PPA is a critical part of the procurement phase of the project. Even though a PPA may take considerable time to negotiate, it will

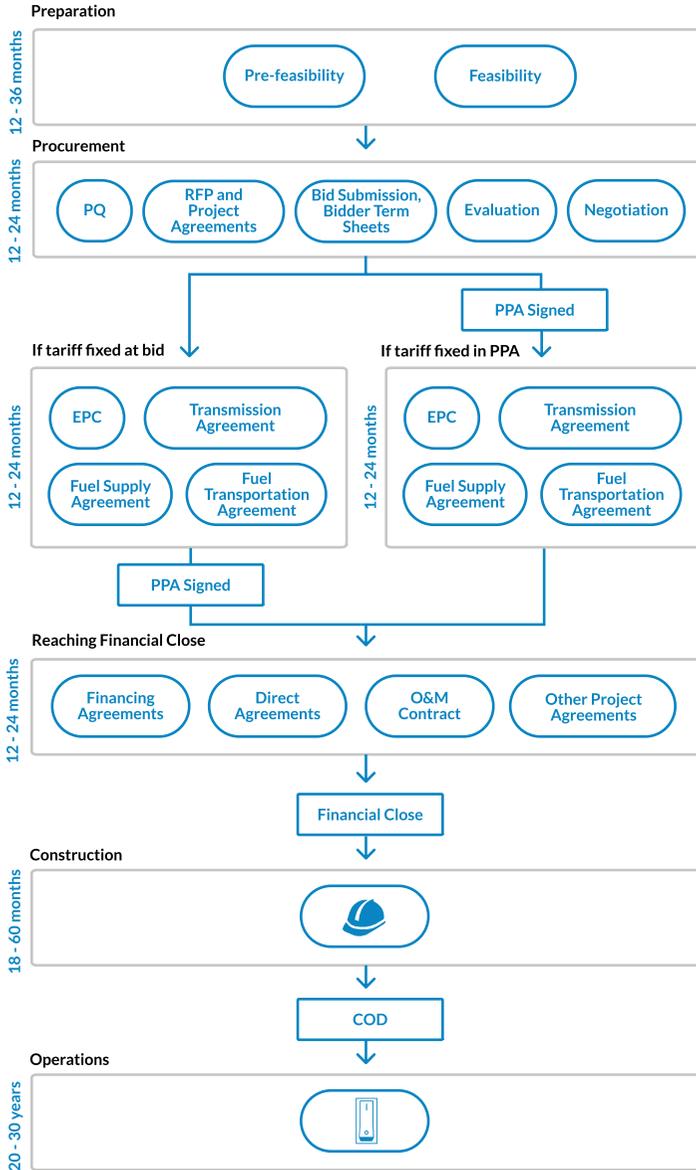
3. POWER PROJECTS IN CONTEXT

govern the project for the next 20 to 30 years and establishes the foundation for the financing, development, construction, operation and maintenance of the project.

Power Generation Project Lifecycle Diagram:

The timelines reflected in the diagram are merely illustrative and may overlap.

3.2. POWER GENERATION MARKETS



3.3. Enabling Private Investment

Private Participation in Power Delivery

The traditional role of the government in providing public services stems from two concurrent social and economic realities: (a) the government is best placed to engage with and be held accountable to the public due to political, cultural and social ties; and (b) public services often require significant infrastructure, and other capital investments that only public financing may be able to cover.

However, governments, especially in emerging markets, are under pressure to use the resources they have for essential services such as education, healthcare, and employment. The delivery of electrical power, which was traditionally a major part of a government's overall public services portfolio, has therefore slowly transitioned from being exclusively funded through public finance to permitting private sector participation. The public concern over private-sector developed power generation projects remains, however, and such projects are consequently subject to heavy regulation.

Time and Money

As private entities, project companies are profit driven and need to receive a reasonable return on equity for the risks associated with engaging in an

emerging market. Where insufficient profit incentives are provided, project companies are unlikely to participate in the market and hence, the power generation which the host country requires will not be built.

Project companies will fund the costs of developing the project with the objective that the project will become operational and generate sufficient revenue to repay that investment together with a return thereon (and any project debt). This period between the initial investment and the operational phase is the riskiest period of any project, and project companies will expect returns that match that risk. Lengthy negotiations, permitting delays, land disputes, etc. will therefore result in higher project costs that will be reflected in higher PPA (and ultimately consumer) tariffs. Project companies may even decide to abandon projects after extended development periods since the level of the tariff required to cover the development costs will not be acceptable to the offtaker.

Special Considerations for Government

Good structuring of PPAs is just one factor in achieving a viable electricity market. The following issues will also need to be dealt with in order to create a sustainable energy market:

1. **Stable and predictable legal and policy framework:** Given the long development period for power sector infrastructure, prior to prospective IPPs entering into long-term PPAs, the laws and policies that impact those investments need to be clear, consistent and predictable.

2. **Demand analysis and transmission system planning:** As with any market, supply should be adjusted to meet demand. In the case of power projects, this requires careful analysis of demand in the marketplace from residential, industrial and other consumers. In addition to forecasting demand, system planning is also needed to ensure that power generation built in response to growing demand can be supplied through a transmission and distribution network with sufficient capacity.
3. **Cost-reflective tariffs:** The tariff charged to electricity consumers should accurately reflect the true cost of generating, transmitting and distributing that power. Without these cost-reflective tariffs, a stable value chain in the market cannot be maintained and significant financial losses will begin to accrue (probably at the public level).
4. **Consumer metering:** Setting tariffs to align with costs is only part of the challenge at the consumer level. The other challenge is collecting payment from consumers. Governments and utilities can increase collections through accurately metering consumption and developing an enforcement culture that ensures consumers who steal or otherwise avoid paying for power are disconnected from the grid.
5. **Independent regulator:** Given the semi-public nature of power services, regulators are often tasked with balancing the concerns of private investors with the needs of public consumers. This balance is challenging, and should be shielded from political or other forms of interference. Regulatory independence is especially important during the transition phase from monopoly to unbundled utilities as the regulator will be in the difficult position of pushing back against entrenched legacy actors.

6. **Stable macroeconomic outlook:** Volatile inflation rates and foreign exchange rates are as fatal to power market stability as downed power lines and exploding transformers. As power markets rely more and more on private capital, any instability in the broader economy will result in rising costs for power projects. This macroeconomic risk is particularly significant for offtakers who receive payments under a PPA in local currency since devaluation of that currency means they will be unable to make payments on debt or other obligations that are denominated in foreign currencies.

3.4. Procurement of Electricity

The price component of a tariff is usually established either by conducting a competitive tender or through direct negotiation. These two methods are explained briefly in the following sections. For an in-depth understanding of the strategic differences between power procurement structures, please review the *Understanding Power Project Procurement handbook*.

In most jurisdictions, procurement laws require host governments and host government-owned or controlled entities to procure goods and services through competitive tenders, subject to certain exceptions. The public policy rationale for these laws is sound. A properly conducted international competitive tender is a very effective tool for using competition to achieve a reduction of the price of capacity and energy, and for increasing transparency in the power market. The competitive procurement of a long-term PPA is, however, often a more complex and lengthier process than a typical public procurement for goods or services. This difference arises from the need for flexible contract terms and clear guidance on legal, financial and technical requirements in power projects, the preparation of which often requires significantly more time than a typical procurement.

In some cases, the inability to accommodate the complexity of larger or unique power projects can preclude competitive procurement altogether due to the difficulty in defining common project requirements that can be bid on by multiple investors. Large scale, project-financed power projects (for example liquefied natural gas (LNG), hydro, or nuclear) are prime examples. The host government may benefit from a degree of flexibility to conduct pre-bid discussions with pre-qualified bidders and post-bid negotiations on (a) the exceptions taken by the preferred bidder in the

3.4. PROCUREMENT OF ELECTRICITY

proposal they submit in response to the Request for Proposal (RfP) issued by the offtaker, and (b) comments that may be received from the lenders following the execution of the PPA but prior to financial close.

In general terms, a well-priced tariff is best achieved by ensuring that a sufficient number of pre-qualified bidders submit a proposal so that competitive pressures result in a favourable economic tariff. A successful tender requires, among other things: (a) a clear and concise RfP that attaches either fully-termed drafts of the project agreements (including the PPA), or, as a minimum, clear and concise term-sheets for the project agreements; (b) bankable terms and conditions in all key project documents, ideally approved by all relevant government agencies and vetted with market stakeholders; and (c) a consultative tender process that facilitates an open dialogue between the pre-qualified bidders and the offtaker.

Under a fixed-price tariff structure, the terms of the RfP require the bidders to bid a fixed price which may be subject to escalation. In the case of a tender structured in the manner suggested above, a RfP for a capacity-based tariff (typically for dispatchable technologies) would normally require bidders to bid on:

1. The base capacity price (which will be used in calculating the hourly base capacity price and therefore the monthly capacity charge).
2. The variable operations and maintenance charge (which will be used to calculate the energy charge).
3. In the case of a thermal generation facility, the heat rate (which is also used to calculate the energy charge).
4. In the case of a coal-fired generation facility, the quantity of coal that is required to undertake a cold start, a warm start, and a hot start.

Bidders can either be required to bid a single hourly base capacity price that applies during each year of the term of the PPA, or they can be permitted to bid a different hourly base capacity price for each year.

3. POWER PROJECTS IN CONTEXT

A portion of the hourly base capacity price that corresponds to the portion of the fixed costs that are attributable to fixed operations and maintenance costs is usually indexed to inflation, as are the variable operations and maintenance charges.

In the case of a project company that generates electricity using a non-dispatchable technology (usually renewables), the RfP typically requires the bidders to bid an energy price stated in cents (or other currency units) per kWh or dollars (or other currency unit) per MWh. As set out in Chapter 6.2 on *Tariff Structures*, this will include all the components that make up the energy charge.

3.5. Environmental and Social Requirements

Power plants generate benefits through electricity production, but also come with a cost to the location in which they are built and the resources on which they draw. Impacts on the local community can occur both during construction (large equipment, increased road traffic, etc.) and operation (noise, air and water pollution). Local law will generally include a number of environmental and social requirements which must be complied with. Additionally, many lenders will expect compliance with their own environmental and social requirements as part of the financing conditions for the project. These considerations are intended in part to ensure the long-term sustainability of the asset as well as the sustainable management of exhaustable resources which are required for the project's operations.

Many DFIs require compliance with the *IFC Environmental and Social Performance Standards*, while others such as the African Development Bank have their own standards (see the *Integrated Safeguard System*). In addition, a number of commercial banks require compliance with the *Equator Principles*. For ease of reference these standards will simply be referred to as *lender standards*.

Environmental Considerations

Different types of power plants create different environmental issues. For example, coal-fired power plants have to address emission levels of sulfur dioxide, nitrogen oxides and dust particles, as well as potential contamination of water sources. Similarly, construction of large hydroelectric plants may involve large-scale resettlement of populations, destruction of forests, degradation of water quality, and diversion of water

sources, all of which impact the environment and affect the ecological system. Wind and solar projects require fairly large tracts of land, if installed on land, and can have negative environmental impacts on birds and bats. No technology is completely free of environmental impacts.

Failure to adequately identify and mitigate environmental risks associated with a project's technology may result in fines or sanctions by local authorities or liability for the project company. Improper identification and mitigation of environmental considerations may also affect the ability to access financing.

Social Considerations

In addition to environmental concerns, local law and lender standards will have requirements pertaining to social considerations to protect human resources. These include provisions relating to gender issues, worker rights, limiting the impact of a power plant on the local community, and issues pertaining to resettlement.

Worker Rights

Local law and the above-mentioned lender standards will all contain requirements pertaining to worker rights. These will relate to the permitted treatment of workers, the minimum age of workers allowed to be employed in connection with the project, and the payment of workers, among other things.

Community Outreach/Impact

While not a party to the PPA, the local community is clearly at risk of being impacted by a power plant co-located in close proximity. The local community is generally considered and treated as stakeholders by lenders. As a result, the lenders will want to identify any risk of economic or physical displacement, and ensure that sufficient compensation is provided.

Lenders will also want to understand community buy-in to the success of the project, and will often look to ensure the community's engagement through community outreach programs.

In order to build a power plant and evacuate the power to a nearby or further substation, it may be necessary or desirable to have people living in the vicinity of the infrastructure to agree to relocate and resettle elsewhere. Resettlement generally refers to being physically displaced or moved from a residence, as well as being economically displaced by losing income, assets or access to a source of livelihood. If any such resettlement is deemed involuntary, this will be an issue of particular concern for the lenders and may prevent certain lenders from providing financing. Involuntary resettlement typically refers to a situation in which the impacted people do not have the right to refuse the resettlement.

Gender Issues

Women make up one of the largest segments of the population which has been historically overlooked and marginalised when it comes to investment countries. Women are generally invisible in the energy sector (as consumers, suppliers and policy and decision makers) in contrast with their substantial roles as household energy managers and agriculture producers coping with environmental degradation and climate change impacts. Due to existing gender disparities in many countries, women disproportionately suffer the health, labour and cost impacts of limited electricity access.

3. POWER PROJECTS IN CONTEXT

2X Women's Initiative and the 2X Challenge In 2018, OPIC (now the DFC) launched the 2X Women's Initiative which successfully catalysed over \$1 billion to invest in women in developing countries. The G7 DFIs – FinDev Canada, the United Kingdom (CDC), OPIC, Italy (Cassa di Risparmio di Roma - Cdp), France (Proparco), Japan (JBIC and JICA), and Germany (DEG) - later established the **2X Challenge** at the 2018 G7 Summit in Charlevoix, Québec, committing to mobilise USD \$3 billion by 2020 for investment in business activities that will benefit women. The Netherlands (Netherlands Development Finance Company), Finland (Finnish Fund for Industrial Cooperation), Sweden (Swedfund), and Denmark (Investment Fund for Developing Countries) have since joined the 2X Challenge. In 2019, OPIC launched 2X Africa, with the aim of unlocking the full economic potential of women in Africa by catalysing \$1 billion, directly investing \$350 million to businesses and funds owned by women, led by women, or providing a good or service that intentionally empowers women on the African continent.

Many Development Finance Institutions (DFIs) have focussed on improving disparities in gender outcomes as a policy priority, by ensuring a gender approach or consideration in their investment and finance decisions.

The transformational nature of improved access to power can have a significant impact on gender outcomes in the community which the power project serves. In order to ensure that these benefits are fully realised, it is necessary to adopt gender-specific strategies as part of any project development, including connecting with any local community development plan associated with an energy project. This may include targeted use of electricity to maximise employment opportunities for women at all stages of the project.

3.6. Summary of Key Points

1. Power generators use renewable and non-renewable sources to produce power either for sale to the grid or directly to the end consumer.
2. Investors and lenders provide the capital to construct, operate and maintain the power assets over the long term.
3. There are various points to consider when locating power projects, such as fuel sources, land availability, environmental and social impacts, project cost, and affordability.
4. An investment-friendly enabling environment with stable and predictable legal and policy frameworks is important for attracting serious developers and sponsors to develop and construct power projects.
5. Coordination between government actors is important in providing a coherent and consistent policy framework to expedite transparent negotiation, development and implementation of power projects.
6. The local community is a key stakeholder in ensuring smooth project implementation.
7. DFIs and lenders need to seriously assess environmental and social compliance during underwriting and monitoring of a financial commitment to a power project.
8. Gender is becoming an increasingly important DFI and foreign government policy priority in determining how to allocate funding in support of projects.
9. Transmission and distribution companies must consider how to evacuate the power from the generator to the end consumer.

3. POWER PROJECTS IN CONTEXT

10. When the sector is not privatized, governments and their agencies are responsible for ensuring that the necessary infrastructure is available to deliver the power to the end consumers, be they corporate or household in nature.
11. Independent regulators set the tariffs for all classes of consumers, which must be cost-reflective and not be influenced by political motives. Otherwise this leads to financially unsustainable power supply companies.

4. The Power Purchase Agreement

4.1. Introduction

The PPA is the agreement that underpins the power project; it brings together the power producer (project company) and buyer (offtaker) and facilitates investment in the power company by the sponsors, developers and lenders by establishing a dependable stream of revenue over the life of the project. The core obligations of the project company and the offtaker are negotiated and set out in the PPA. The project company typically has an obligation to arrange the investment and financing for the project and then leverage that financing to construct, operate and maintain the asset during the PPA term. The offtaker typically has the obligation to make payments to the project company for the capacity, availability and/or power delivered by the project. In addition to these obligations, the PPA will set out the parties' agreement on how to test the power plant, resolve disputes, and handle major events like force majeure and termination. There are also a number of permits, approvals and contracts associated with the PPA, for example sovereign support, environmental and social impacts, land acquisition or leases, fuel supply and logistics, EPC and O&M and finance agreements.

4.2. Origins of a PPA

A PPA is the foundational document for most power projects and the fundamental instrument to facilitate the sale and purchase of electrical power. As such, it only comes into being once the offtaker has established certain facts and made a series of important decisions. These may include determining the power demand, the available sources of power to meet that demand, the offtaker's economic ability to purchase additional power, the power-generating technology desired, and the location of the power plants relative to existing power market infrastructure and demand centres.

Power Demand

Prior to approaching the market for new generation, the offtaker has to assure itself of the power demand. The offtaker or systems operator would ideally have its short-, medium- and long-term demand forecasts at hand. Demand estimation may occur as part of a larger power market study, sometimes termed an integrated resource plan, that is led by the offtaker and/or the regulator. Demand and load forecasts are highly correlated to economic growth. Unmet power demand has restricted economic growth in many emerging economies. A broader economic analysis involving non-power sector stakeholders such as the ministry of finance may, therefore, be required.

Transmission Infrastructure

The ability to evacuate power from a power plant is critical to its success. Insufficient transmission capacity can lead to severe delays in reaching commercial operation. The offtaker should take primary responsibility for the planning and availability of transmission infrastructure to ensure that the country benefits from the new power generation source as soon as possible.

Budget and Technology

After identifying the need for power, the offtaker must identify potential energy sources for new generation. This determination will depend on the demand curves and daily future load forecast, time of use, and approximate tariff at which it can afford to purchase power. The determination regarding the offtaker's budget will go hand-in-hand with the selection of power-generating technology. Certain technologies are more expensive than others, but may be desirable due to their ability to increase their supply when demand is greatest, or because of their environmental benefits and availability of funding.

Location

The offtaker will also need to determine where the power source should be located. The location is typically determined on the basis of which regions of the country need additional power. If possible, the location should be near substations and transmission lines that can carry power most efficiently to consumers. Ultimately, the offtaker (and project company) will want to locate the power source as close as possible to a connection point on the power grid to avoid the cost and risk of building transmission infrastructure and any transmission line losses.

Other equally important issues that will determine location are easy access to the fuel source, the potential social and environmental impact of any power plant on local communities, and whether efficient or low-cost mitigants are available. A gas-fired power plant, for example, would be of little use in a remote area where there is not an economically efficient source of gas. Certain renewable energy resources, such as solar or wind, may be more appropriate for remote locations. The choice of power-

generating technology is an important one for the offtaker. It will have a direct impact on the cost and reliability of power, as well as the environmental and social impacts of the project.

Special Considerations for Renewable Energy

When considering what technologies to use, an offtaker will want to bear in mind the following features specific to renewable power.

Unique Advantages

1. **Concern regarding climate change:** This creates a policy driver in many jurisdictions for support for renewable power as a mechanism to both improve energy access and reduce carbon emissions. At the same time, certain forms of renewable power can satisfy a number of other policy objectives.
2. **Security of supply:** Where a country is a net importer of energy, renewable power improves the host government's ability to ensure a secure supply of electricity by reducing its dependence on foreign fuel supplies.
3. **Reduced cost/risk:** The removal of fuel costs from the PPA tariff eliminates a typically high-value component of the tariff, which, in turn, decreases the exposure of the offtaker to exchange rate volatility (fuel supply agreements are typically in foreign currency).
4. **Speed of deployment:** A typical mid-sized solar or wind project can reach commercial operation date (COD) within 12-18 months from the execution of the PPA in emerging markets, whereas a thermal plant will take 3-5 years.

5. **Fewer triggers for termination:** The parties to the PPA do not need to allocate the risk of non-delivery of fuel.
6. **Greater shift of risk to defaulting sellers:** In considering whether a set of termination payments are bankable, lenders have shown themselves more disposed to accept no termination payment for seller default for non-dispatchable renewable projects.
7. **Lower decommissioning costs:** The process of decommissioning a non-dispatchable renewable project is generally simpler, with less risk of environmental contamination.

Unique Risks

The advantages of renewables need to be balanced against the fact that wind and solar projects generally provide fewer MW of electricity than a typical dispatchable plant. Further, the actual capacity is normally less than the nameplate capacity in most weather conditions. Changes in weather also lead to intermittent supply. With these challenges in mind, the rapid growth of renewable energy projects over the last decade has produced some best practices for reducing or avoiding these risks:

- **Geographical spread:** Countries with high levels of renewable projects find that differing weather conditions across a country can lead to a balancing out of supply peaks and troughs across the grid.
- **Wind turbine momentum:** Unlike the potentially highly intermittent nature of solar PV generation in certain weather conditions, wind turbine rotation starts and stops gradually, enabling grid operators to manage the ramping up of baseload power more easily.
- **Storage options:** Please refer to *Chapter 5.3*.

Overview of PPA Obligations

The main obligation of the offtaker under the PPA is to pay the agreed tariff when due. The project company's primary responsibilities are to develop, finance, design, build, operate and maintain the power plant in accordance with the requirements of the PPA and applicable law, and deliver the agreed amount of power in accordance with the PPA. However, the parties' obligations do not stop there.

Additional obligations relate primarily to the need for: (a) payment and performance security; (b) transmission of power and interconnection to the grid; (c) arrangements with lenders; (d) consents, permits, approvals and licenses; (e) rights to the land on which the power plant and/or transmission lines will be located; and (f) insurance.

For the most part, these obligations do not fall solely on one party alone, but are often shared by parties or will shift from one party to another based on the circumstances surrounding the power plant and where it is located.

4. THE POWER PURCHASE AGREEMENT

	Offtaker	Project Company
Primary obligations	Make payment	Build and operate power plant; deliver agreed energy
Security	Payment security	Performance security
Transmission/ Interconnection	Transmission/ Interconnection (bundled and some unbundled)	Transmission/ Interconnection (some unbundled)
Arrangements with lenders	Direct agreement	Financing
Permits	Assistance with permits/certain buyer approvals	Obtaining permits
Land	Grant of land/assistance with obtaining land	Obtaining land
Insurance	Force majeure, business interruption	Force majeure, currency, etc.
Local content and ownership	N/A	Ownership, labour, materials, equipment
Decommission	N/A	Decommission, cleanup

4.3. Crafting the PPA

In competitive bidding, the draft PPA is sometimes included in the RfP package to enable prospective bidders to ensure that project risk allocations are given due consideration in the submissions of their bids. In direct negotiations, by comparison, the offtaker has the option to provide a draft PPA to the project company after satisfactory due diligence to ascertain the viability and feasibility of the proposal.

The first draft of the PPA can sometimes come from the project company. However, as the offtaker is seeking to purchase the power, and will be relying on the document for years to come, it is advisable for the offtaker to take responsibility for preparing the initial draft PPA **with the assistance of qualified legal counsel**. Many multilateral and bilateral development institutions have financing available to government entity offtakers to hire qualified legal counsel.

There are also instances where the prospective offtaker is a large industrial user of power, and in such instances it may be that the initial draft of the PPA comes from the IPP for the offtaker's review as part of the process of evaluating the merits of the proposal.

In preparation for the negotiation process, it is advisable for both parties to engage knowledgeable legal counsel as well as technical and financial consultants. The parties will benefit from the advice of these consultants in determining which risks and obligations are properly allocated to each party. This is an ongoing process which will allow each of the parties to better understand the transaction they are entering into, with the goal of arriving at an agreement that both parties can ultimately execute and abide by, and which will be bankable.

Involving the Stakeholders

The full process of negotiating a PPA is a delicate matter which will require the involvement of several stakeholders who each play a role at various stages of the project. Offtakers, especially state-owned utilities, will want to engage early with the different government stakeholders to avoid delays or even failures in the implementation of a PPA. Consultation by key stakeholders throughout the negotiation process will ensure that the terms are aligned with local laws and practices.

The level of involvement of stakeholder representatives directly in the negotiations varies. Typically, ministries of energy and finance are essential for any project that will require some level of government support. Ministries of land and environment, the central bank, the attorney general's office and other institutions should also be consulted.

To ensure the buy-in and timely input of the different governmental institutions, several jurisdictions have chosen a committee approach to the negotiation of PPAs. A committee comprised of representatives from each key stakeholder is established to oversee the negotiations and validate the decisions made on the terms of the PPA. The size and composition of such committees must be carefully considered to avoid jeopardizing the efficiency of the decision making process.

Where projects are being financed by lenders, they will need to be comfortable with the PPA before it can truly be deemed complete. Although typically not a party to the PPA, the lenders will want to assure themselves that the documentation governing the availability of revenue to repay their loan, the PPA, is satisfactory to them. The lenders will therefore seek to clarify or even modify provisions in the PPA to grant them greater confidence regarding the ability of their borrower, the project company, to rely on the PPA as a source of repayment of their loans. The lenders may seek to make clarifications or modifications to the

4.3. CRAFTING THE PPA

PPA even if it has already been signed. Such amendment could be contained in an addendum to the PPA, or contained in a document referred to as a “direct agreement.” This direct agreement will be entered into by the offtaker, the project company, and the lenders, and may include any amendments to the PPA required by the lenders, as well as certain provisions related to the offtaker’s consent to the project company’s collateral or conditional assignment of the PPA to the lenders in a default scenario, and the lenders’ step-in rights.

Where the offtaker or host government has adopted the approach of a standardised non-negotiable PPA, it would be prudent to engage with the lenders in advance or during the procurement phase to test the bankability of the agreements. These discussions will also allow the lender to address any material concerns which may limit the project company’s ability to access funding or unreasonably increase the cost of financing.

Before the PPA is deemed ready for execution by any one of the parties, each party will need to determine whether the PPA needs to be approved by their senior management, a parliament or legislative body, a regulatory body, and/or another host government entity. It is critical to the enforceability of the PPA and the stability of the long-term relationship being established that all such approvals and consents have been obtained.

4.4. Memoranda of Understanding (MoUs)

While much of this book focuses on the PPA and the extensive list of issues negotiated as part of such an agreement, the PPA may not be the first written agreement between the project company and the offtaker. For projects that are not competitively tendered, negotiations often begin at a much earlier stage where the project company has a general idea of the project design/location, and the host government has an equally vague idea about how the project may fit into their overall power market development strategy. At this early stage, the two parties may seek to establish points of reference for their general agreement regarding the project details in a non-binding and minimally-negotiated agreement that is often termed a Memorandum of Understanding (**MoU**). While this general agreement may be valuable in demonstrating the potential of a given project to key players of both parties, the signing of such agreements by a host government comes with a cost, which should be carefully managed as part of an overall investment strategy.

What is an MoU?

The term MoU generally refers to a non-binding document that sets out the broad principles and concepts that the parties have tentatively agreed upon, typically as a precursor to agreeing and signing more detailed and formal documentation later. In the context of a power project, the MoU often focuses on the intent of the project company to develop a project of a specific size and technology, and may go as far as detailing the location and timeline for project development. This type of agreement may also be referred to by other titles, such as Letters of Intent, Heads of Terms, or Term Sheets. While the MoU may be signed by the project company and the host government (possibly as part of a grand ceremony) it is typically

explicitly non-binding, includes only general project details and expressions of intent, and is often not subjected to rigorous legal review. Care should be taken, however, to ensure that a “non-binding” MoU is not inadvertently “over-drafted” to imply specific and detailed obligations undertaken by the parties. Under the local laws of some countries, such specificity may undercut the non-binding nature of the MoU. In some cases, project companies have successfully sued governments for non-performance under an MoU that was ostensibly non-binding. Even if non-binding, the quasi-legal status of the MoU, as an indication of interest but not a firm obligation, has both advantages and disadvantages for host governments.

What are the benefits and dangers of an MoU?

When deployed strategically, an MoU can serve as an early indicator of project potential for key constituencies in the power market. At the public level, the MoU can broadcast to consumers that the government is actively seeking and securing investment in the power sector and serve as the starting point for consultation around public policy concerns such as land use, environmental impact, and local content. At the investor level, the MoU can be leveraged by the project company to attract interest from equity investors and potential lenders (who may even go so far as to provide a letter of interest to the potential project company). The MoU may also satisfy political objectives, such as indicating the flow of investment from strategic countries or the opening of a market following a significant political reform.

The high visibility of MoUs and their potential political uses also lead to many of their possible disadvantages. If overly politicised, MoUs may deter investors who would prefer to be seen as neutral commercial actors rather than as allies of a politician. Similarly, if the government is overly eager in

its signing of MoUs, the existence of multiple agreements may signal that the market is saturated, even though many of those projects have a low probability of ever being built.

What strategies can governments deploy around MoUs?

To capture the value of MoUs, host governments should consider the following guidelines when preparing and signing this type of agreement:

- Evaluate the qualifications of the project company to make sure that it has the financial and technical capacity to deliver the scale of project and technology that it is proposing.
- Include a detailed timeline within the agreement to incentivise both parties to reach certain key milestones. For example, if the project company does not file for permits, obtain land and/or secure minimal equity/debt commitments, then the MoU should expire so that it ceases to be viewed as a viable project in the market.
- If a project company is actively developing the project, but the host government is delayed in its approvals, it should include a mechanism for extending the MoU.
- The host government should direct project proposals to a neutral or trusted point of contact, such as an investment authority or market regulator.
- Signed MoUs should be disclosed to the public by the host government in order to build investor confidence that there are not multiple unreported project proposals crowding the marketplace.

A word on initialing PPAs

Sometimes parties wish to show progress by initialing a draft PPA before it is ready to be signed. This is often done for the same reasons that parties seek to sign MoUs, and typically comes with the same risks. Unlike an MoU, however, an initialled PPA does not explicitly claim to be non-binding, is generally much more detailed, and does not indicate which provisions are still subject to negotiation. These features create a risk that a court or arbitrator might agree to enforce the draft against the parties even without signature. Initialling the PPA also strongly implies that the parties will sign. This risks creating liability for a party if it ultimately determines not to sign the PPA or seeks to renegotiate one or more provisions prior to signature. For these reasons, initialing a PPA can create unnecessary ambiguity and liability.

If the parties are not ready to sign the PPA, it is much better to jointly sign an explicitly non-binding letter or statement that explains the progress made to date and notes that items remain to be agreed before the parties sign the PPA.

4.5. Related Project Agreements

Whilst the PPA governs the sale and purchase of power, there are a number of related contracts that interplay and relate to the financing, building and operation of a power plant. These agreements must be aligned with the PPA to ensure fair apportionment of risks. For example, the duration of the PPA should be synchronised to the life of the loan to ensure the loan is repaid before the PPA expires. Additionally, each of the parties to the Engineering, Procurement and Construction Contract (**EPC Contract**) and the Operating and Maintenance Agreement (**O&M Agreement**) / Long-Term Service Agreement (**LTSA**) will need to be familiar with, and agree to abide by, the terms of the PPA relating to the design, construction, operation and maintenance of the power plant.

The following are some of the related project agreements typically necessary for a power project:

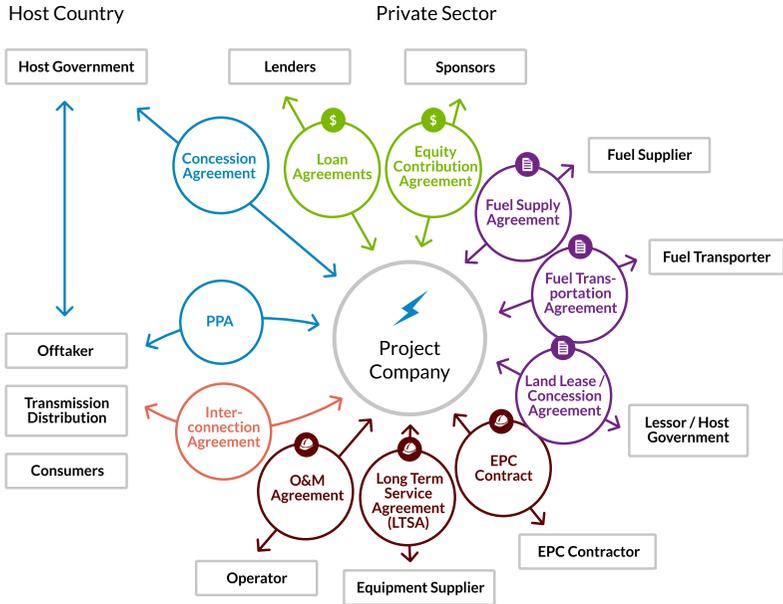
1. **Concession/Implementation Agreement:** Grants the project company the right to develop, finance, construct, and operate the power plant, including the right to sell power to the offtaker.
2. **Grid Interconnection Agreement:** Governs the connection of the power plant with the power grid.
3. **Land Lease Agreement or Land Concession Agreement:** Governs the lease/concession of the land where the power plant is developed.
4. **Fuel Supply Agreements/Bulk Supply Agreement:** Establishes the availability and quality of the fuel supply.
5. **Fuel Transportation Agreement:** Provides for transporting the fuel from the fuel supplier to the power plant.

4.5. RELATED PROJECT AGREEMENTS

6. **Engineering, Procurement and Construction Agreement (EPC Contracts):** Sets the terms and conditions for the design of the power plant, the procurement of materials and equipment, and the construction of the power plant. The obligations created under this agreement can also be divided among multiple contracts that include one or more of these scopes.
7. **Operating and Maintenance Agreement (O&M Agreement):** Governs the rights and responsibilities of the entity that will operate the plant and be responsible for its maintenance.
8. **Long Term Service Agreement (LTSA):** Provides for servicing the power plant at regular intervals during the operation of the PPA.
9. **Loan Agreement:** Creates the obligation of the lenders to finance the power plant, as well as the obligations of the project company to comply with various covenants in the loan agreement.
10. **Equity Contribution Agreement:** Obliges the owners of the power plant project company to make equity or subordinated debt contributions to finance the portion of the power plant not being financed by the lenders. It may also include obligations to provide additional financial support to the project company if required.
11. **Sovereign Support Agreement:** May include sovereign guarantees, comfort letters, put and call options, and other forms of sovereign support that enhance the creditworthiness of the offtaker and other government entities involved in the project.
12. **Credit Support Agreement:** May include partial risk guarantees (PRGs), letters of credit and bank guarantees from commercial banks, and escrow agreements.
13. **Direct Agreement:** Governs the relationship between the lenders and the parties involved in the project other than the project company. For example, the Offtaker and government will typically sign direct agreements with the lenders.

4. THE POWER PURCHASE AGREEMENT

The following chart illustrates the relationships between the different types of agreements:



4.6. Timing Considerations

An offtaker enters into a PPA in anticipation of having additional power available to it on a scheduled date, the COD. In order to achieve this date, the PPA will include certain milestones and deadlines. Failure to meet these deadlines can result in penalties for the project company and in some cases the termination of the PPA.

Effective Date and Conditions Precedent

While some PPAs become effective when signed by all parties, others only become effective post-signature once certain preset conditions have been met. The parties will want to carefully craft the preset conditions to make sure they are truly necessary and can be met in a timely manner. Lenders in particular will want to ensure that the PPA has been signed and become effective before they are willing to lend, and will thus pay close attention to such conditions. The longer it takes to meet the conditions for effectiveness, the greater the risk that the conditions will not be met and that the parties may seek other opportunities.

Milestones

The PPA allocates various legal, commercial, technical, and financial obligations between the offtaker and the project company. Some of these obligations must be completed in accordance with an agreed schedule to avoid non-compliance with, and possible penalties under or termination of, the PPA. It is therefore important for the parties to have a shared understanding of key milestones and the consequences of delays.

4. THE POWER PURCHASE AGREEMENT

Milestones	Required by PPA	Late satisfaction terminates PPA
Land acquisition	Yes	No
Major permits: application	Yes	Sometimes
Major permits: receipt	Yes	Rarely
Financial close	Yes	Yes
Signing EPC/Issuing notice to proceed	Yes	Rarely
Commencement of construction	Yes	Sometimes
COD	Yes	Yes

The parties to the PPA have different considerations in analysing the inclusion of contractual milestones and deadlines in the PPA.

The Offtaker/Host Government

The offtaker and host government in particular rely on milestones for the following purposes:

- Host governments and offtakers need to ensure that power for which they have contracted will come online when needed in order to meet their needs.
- Host governments and offtakers must also be able to budget for their estimated PPA payment obligations and will require certainty on when their obligations under a PPA will become effective and ensure a project company meets scheduled COD.
- Where the host government offers credit support to the project company, it needs to know when such obligations might take effect, given the potential impact such contingent liabilities might have on its ability to borrow.

- From a system planning point of view, the host government and offtaker would want to know when power will be injected at the planned location on the grid. Delays in the development of a power project not only create problems for grid operators attempting to balance system demands; they also prevent other power plants that may be ready from connecting at the same connection point.

The Project Company

The project company primarily wants to avoid incurring delay liquidated damages or for the PPA to be terminated by the offtaker, because these actions will materially impact its profit or deprive it of its sole revenue contract. To this end, when analysing PPA deadlines the project company will want to ensure that:

- Deadlines provide them with reasonable time to achieve milestones, allowing for delays that may arise.
- Deadlines are extended for delays caused by force majeure, delay in connection, and the offtaker's breach of the PPA.

The Lenders

Since the PPA is the project company's primary source of revenue, the lenders' incentives are aligned with those of the project company in not wanting the PPA to be terminated. Similarly, the lenders will want the project company to be able to avoid having to pay liquidated damages that might inhibit its ability to service its debt.

Delay Liquidated Damages

As noted above, the offtaker and host government want to know when a power plant will reach COD. In order to properly incentivise a project company to achieve the scheduled COD, and to cover any costs that might be incurred by the offtaker as a result of delay, PPAs will often include liquidated damages payable by the project company for failure to achieve

COD by the scheduled date. Such damages should be sized appropriately because delay liquidated damages that are perceived as being too high by project companies (or the contractors who will often ultimately bear such costs) will probably result in higher construction contract pricing and likely higher tariffs.

Credit Support for the Project Company's Obligations

The project company is a special purpose vehicle (SPV) with no assets other than the project. As a result, it may not have the wherewithal to cover liquidated damage obligations, so an offtaker may require it to post a letter of credit, bank guarantee or some other form of collateral to mitigate its obligation. Such security instruments are typically financed and result in higher costs for the project company, which often results in a higher tariff under the PPA.

From the perspective of the project company, it is essential to ensure that its liabilities under the credit support offered to the offtaker are no greater than the liquidated damages payable by the EPC contractor and the credit support provided by the EPC contractor. To ensure that these financial obligations can be met, the host government, the offtaker and the lenders will normally expect credit support from the project company and the EPC contractor.

Development bond: In certain jurisdictions, the project company may be required to post a development bond to bid for a tender or in consideration of a government consent and support or concession agreement. If the project is unable to reach specified milestones for reasons attributable to the developer, and thus the PPA does not become effective at a given date, the offtaker may draw on the development bond.

4.7. Summary of Key Points

Before the PPA:

- **Tariff, technology and location:** Before a PPA is drafted, an offtaker will need to decide on their budget, which power-generating technology they want to use, and where geographically the power is needed.
- **Technology:** The choice of power-generating technology is important for the offtaker and will have a direct impact on the cost and reliability of power.
- **Location:** Offtakers will want to locate the power source as close as possible to a connection point on the power grid and to the power consumers to avoid transmission line losses and optimise accessibility to fuel sources.

Power Procurement and Tariff Considerations:

- **Procurement methods:** Offtakers may pursue either a structured competitive tender or a more open process of direct negotiations to procure power. In either case, the offtaker and project company should work together to carefully manage the legal, financial and regulatory risks associated with the development of a new power project.
- **Quality matters:** The offtaker should select a project based not only on price, but also on quality and track record.

PPA Drafting:

- **Who takes the pen:** The initial draft of the PPA can come from either the project company or the offtaker, but is typically generated by the offtaker.
- **The importance of legal counsel:** The offtaker should seek the advice of qualified legal counsel when preparing the PPA.

Negotiation and Finalisation:

- **Details:** The offtaker and project company will need to negotiate the PPA to ensure that both parties are aware of, and can agree to comply with, their obligations.
- **Lender input:** For projects being financed with debt, before a PPA can be considered final it must be satisfactory to the lender. Lenders may require changes to the PPA even if the project company and offtaker have already signed the agreement.

Memorandum of Understanding (MoU):

- An MoU, which generally viewed as a lighter, non-binding agreement, can have a serious impact as an indicator of activity in a power market and may possibly result in liabilities for the host government.
- Host governments should use the same level of discretion and care in negotiating MoUs as they do for PPAs to ensure that they capture the value of MoUs but avoid the pitfalls.

Timing Considerations:

- To ensure that all parties satisfy their obligations in a timely manner in order to deliver the project on the timeline defined in the PPA, the agreement may set out milestones and incentive/penalties for failure to satisfy the milestones.

5. Financing of Power Projects

5.1. Introduction

There are a range of structures and options to finance power projects whose pricing, terms and conditions will vary depending on the risk allocation amongst the parties and commercial viability of a project. The chosen structure and source(s) of funding will have a direct impact on the project company's cost and timing, which are the most important considerations when managing expectations with respect to meeting construction milestones and ultimately COD.

Aside from the impact of the source(s) of funding on the project's tariff, the financial costs will also vary, based on the risk factors affecting the project's capacity to generate sufficient and reliable cashflows to meet its repayment obligations. Hence, the creditworthiness of the offtaker and risk-mitigating instruments are crucial elements in determining a project's **bankability**, and its ability to attract long-term debt financing.

As the strongest credit in the country and the indirect beneficiary of the project, the host government is well positioned to provide credit support to ensure its obligations through different arrangements. Since the host government is a central figure in ensuring the successful implementation of a project, especially in the case of a PPA with a state-owned offtaker, it is often requested to mitigate some of the risks related to the political and physical environments, and to provide essential infrastructure, such as the transmission and distribution network or fuel supply.

5.2. Project Finance

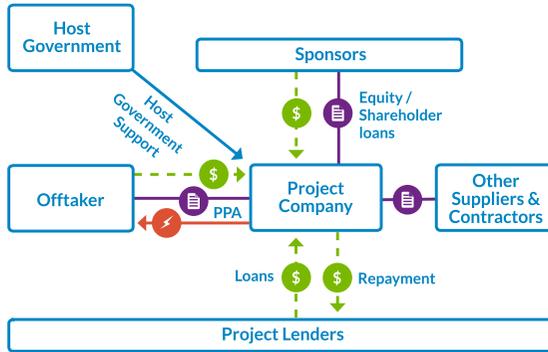
What is Project Finance?

Project finance refers to the financing of a project company by equity investors and lenders based on (a) the projected (contractual) cashflows of the project and (b) the underlying power asset value. Project financing is typically limited or non-recourse, i.e. the lenders have recourse to the project company and the assets of the project itself, but they have limited or no recourse to the ultimate owners of the project company. The lenders are ordinarily repaid by project cashflows. In a worst-case scenario, and setting aside the issue of termination payments and host government support (which are discussed later in this book), the lenders will be repaid by foreclosing on the project and acquiring the project assets. In a limited recourse financing, the lenders will also typically benefit from sponsor credit support, including sponsor guarantees to cover certain risks.

In a typical project financing, an SPV is created to own the assets of the project and enter into the financing and project agreements, including the PPA. The project finance lenders will take a security interest in all of the assets of the project, including the PPA, and other major project documents. The lenders will also have a security interest in the project accounts, and all of the amounts on deposit therein, or credited to, those accounts. Lenders may impose strict requirements on the location of all project accounts, and in the flow of funds through these accounts. In particular, the cashflow is restricted such that the project company cannot pay dividends or distributions without first meeting various conditions - often, no distributions will be made to the sponsors for a number of years.

5. FINANCING OF POWER PROJECTS

The diagram below illustrates the typical financing arrangements associated with a project finance structure.



The main strength of project finance is that it does not require an upfront capital outlay from the host government. However, due to the lenders' security interests and their extensive involvement in the project agreements, including with respect to cashflows and capital management decisions, project finance requires a complex set of highly-tailored agreements. This can impose high transaction costs and execution timing delays due to significant coordination of parties to manage complexity.

Project Finance: Role of Developers and Sponsors

The private sector's involvement in the power sector takes on two driving roles: that of developer and sponsor. These roles are in many instances fulfilled by the same party. However, the roles may be split, and sometimes are fulfilled by a consortium. The developer is often the project originator, often a local party, who develops the project to a point where it requires large amounts of capital/equity. A local party with a keen understanding of the domestic power context and political environment dynamics can be advantageous. The developer will generally identify and procure, either outright or through a long-term lease, suitable land for the project. In addition, the developer will commission an environmental and social impact assessment (**ESIA**) and obtain a written commitment for a PPA, including the tariff (and host government support), with the offtaker. The developer (if not the same party as the sponsor) will then approach the market and enter into a development agreement with the sponsor or other international developers, assuming those entities can bring the financial resources required to develop and construct the project. The sponsor provides the funding to move from concept to financial close.

The sponsor's activities include paying for or finalising the:

- ESIA according to international lender standards, with a strong emphasis on the impact on local communities and the long-term sustained effect of the project on them.
- Renewable resource measurements, which typically take at least 12 months in most cases.
- Site design and layout.
- Detailed engineering design, tender processes, and selecting EPC contractors and equipment suppliers.
- Project debt raising.
- Investment committee approval for its own sponsor equity.
- The conclusion of all project legal agreements.
- Project construction and commissioning.
- Operation of the project assets.

Why Project Finance?

Why do power projects need debt from lenders? Can these projects be financed on the balance sheets of large corporate sponsors? Should the host government just build them instead? It is hard enough to design and build a project - and to negotiate a PPA - without lender involvement. Why worry about catering to lenders and their concerns about bankability? These legitimate questions are often raised by policymakers and should be answered for any given project while keeping in mind that the goal for any power project is to produce reliable power at the lowest possible cost.

Debt can be expensive, especially project finance debt, and especially when compared to a host government's ability to finance the construction of a power project using their sovereign balance sheet. There are also forms of borrowing, such as concessional financing from DFIs (see *Example: Bankability for Renewable Projects*) as opposed to their standard market priced financing, that have lower costs than commercial project financing. However, it is important not only to consider the cost of these sources of financing. Host government funding may be cheaper, but tying up massive volumes of public capital that could otherwise be used to support social programmes, national security, or other infrastructure projects, may not be a prudent policy decision. Similarly, DFI concessional financing is very limited when compared to general commercial financing available from DFIs, and is often earmarked for emerging technologies or high-risk markets that would otherwise be unbankable without access to this lower cost of capital. Thus, the use of government or concessional funds comes at the opportunity cost of using those financial resources for other high impact and cost-sensitive investments. In addition to the standard due diligence involved in credit underwriting, which itself is time consuming, DFIs will have to undertake a separate analysis and justification of development impact when deploying concessional resources.

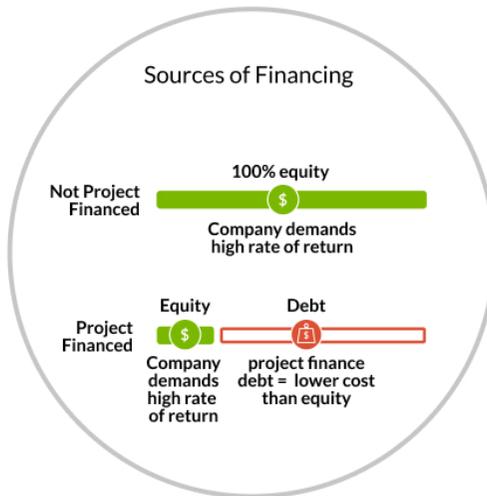
Practice note: Blended Finance and Procurement Platforms

In order to bring together larger pools of capital for renewable and other high-priority energy projects, some DFIs have begun to combine the limited-pool, below-market concessional financing (from DFIs or special funds) with the larger pool of market-priced financing (also from DFIs or commercial lenders) to reduce the cost of capital in project financing. This form of “blended finance” has the advantage of discounting market rates and offering lower-cost lending in emerging markets where power projects may otherwise be unbankable or unsustainable due to non-cost reflective local tariffs. Blended finance may also be combined with a set of standardised project agreements and host government guarantees to further de-risk projects and bring down transactional costs. Blended finance “platforms” are being deployed around the world and have helped yield record low PPA prices, especially for standardised technologies such as solar PV. It is critically important, however, that host governments realise that these results cannot easily be replicated across markets because:

- Even when blended, concessional funding from DFIs is very limited. As a result, unless host governments can successfully navigate the highly competitive process to secure DFI concessional funding, and pass those funds along to project companies, they cannot expect project companies in their market to reproduce the same low tariffs as other projects which benefit from concessional finance.
- The goal of standardisation is not to create a perfect set of project agreements, instead it is to introduce consistency and alignment of technical and commercial terms across both the regulatory domain and project structure. In other words, a host government cannot simply copy the contracts from a neighboring market and expect the same prices, it must also put in place the political, regulatory and financial reforms necessary for successful implementation of that contract.

5. FINANCING OF POWER PROJECTS

Power projects can also be financed on the balance sheet of large corporate developers. While certain creditworthy corporate developers may have access to low-cost capital market funding, their managers (and their treasury departments) still consider all available internal funds to be equity when making investment decisions. Companies seek high internal rates of return for their equity, based on the opportunity cost of where else they could be investing those resources. Host governments are often surprised that this does not result in cost savings for the project.



As shown above, in general, the less equity that is involved in a project, the lower the likely cost of the overall financing. As a practical matter, this may vary depending on how much credit support is required in connection with the project financing (since each element of credit support will impose additional costs). It will also vary, based on the rates of return required by the equity and the interest rate for the debt.

Even where large corporate developers potentially have access to low-cost capital funding, they may still prefer to develop this type of project using limited or non-recourse financing to ensure that the loan facility does not feature on the balance sheet. It may also be more attractive to lenders to lend to new SPVs, as such entities are unencumbered with existing liabilities.

For the reasons highlighted above, project finance has been the most common financing approach for large-scale power projects in emerging markets in the last two decades. An analysis should always be made as to whether this is the right financing approach for a specific project, but once the decision is made to go forward with a project finance structure, the concerns of lenders should be considered while negotiating the terms of the PPA to ensure the successful completion of the project. An offtaker without insights into the lenders' expectations will be at a significant disadvantage during the project negotiations.

Although most parts remain relevant for a project financed on the developer's balance sheet, this book assumes that the PPA is negotiated in a project finance context. For a more detailed exploration of other financing structures, including host-country financing, as well as respective strengths and weaknesses of these alternatives, you may refer to the handbook *Understanding Power Project Financing*.

5.3. Bankability

Bankability refers to whether a project will be acceptable to lenders, and refers to the scope of consideration of a project seeking project financing in the commercial lending market. However, a project can also obtain financing from lenders other than commercial banks, including **DFIs** and private equity funds. Therefore, bankability can also be thought of as the ability to attract financing from any source of funds rather than limiting it to one particular source.

The Role of the PPA in Bankability

The power purchase agreement is key to bankability. For the typical power project, there is only one stream of revenue - payments from the buyer under the PPA. If the buyer fails to pay, it will be very difficult for the project to repay its lenders on a timely basis.

The PPA also helps to accommodate the unique nature of power projects. Power generation is unique in that the electricity generated is being sold into a geographically limited, and often highly regulated, market. As opposed to other high-value commodities such as hydrocarbons, minerals or precious metals that can be transported to meet demand, the power project is beholden to the demand of the market that it serves. Similarly, the pricing of electricity to end-users in emerging markets is often guided by regulation rather than by market forces. The PPA is essential because it addresses both the uncertainty in demand and in pricing. On the demand side, the PPA establishes a long-term purchase obligation that provides a consistent revenue stream to the producer and a consistent flow of electricity to the offtaker. On the pricing side, the PPA incorporates a tariff formula that is tailored to the technology, operations, and debt characteristics of the project, which can be modeled over the full life of the project. This allows the PPA to establish an electricity price that reflects the true cost of generating the power.

Risks to Bankability

In the typical power project financing, the only financial return to lenders is the repayment of the project debt and the payment of interest rates (along with certain agreed fees). However, since debt providers have large capital outlays at risk, and depend exclusively on revenues from the project for repayment, the lenders will insist that the project sponsors and documents are strong enough for the project to reach commercial operations. The lenders, among all of the parties, want to avoid a catastrophic scenario where the project fails completely, especially during the construction phase of the project. At operations, the overarching concern is ensuring that revenues are adequate to service debt.

The following lists the key considerations which, if not sufficiently covered, will make a project unlikely to receive debt financing:

1. **Term:** The term of the PPA should be long enough to allow the debt to be repaid, and if the debt is not fully amortised (in other words, if there will be principal amount outstanding at maturity) the term of the PPA should be long enough to support a refinancing of the remaining debt.
2. **Tariff:** Lenders will require certainty with respect to the tariff payable under the PPA.
3. **Changes in law and tax:** Lenders are not in a position to take any risk related to changes in law or taxes over the life of the project.
4. **Offtaker creditworthiness:** If the offtaker is not sufficiently creditworthy, lenders will require other broad forms of credit support that create additional costs and complications for the project. Even in developed markets, many offtakers are not sufficiently creditworthy to create a financeable project.
5. **Sponsor quality:** The lender and offtaker will consider the experience, reputation and financial strength of the ultimate owners of the project company.

6. **Billing and payment:** The billing period from the offtaker to the producer should be frequent enough (monthly or even bi-weekly) to minimise the level of unpaid energy and ensure that the schedule of debt service payments are adhered to. It also alerts the lenders to potential payment/liquidity issues.
7. **Currency/Calculation:** PPA payments and calculations are most often made in the same currency as that needed to repay the debt. If not, there will need to be a plan for foreign exchange hedging and/or exchange rate indexation and a true-up mechanism. In addition, are there any convertibility issues with the payment currency? If so, the lenders may require payment to be made in a different currency, or the offtaker or the host government will need to guarantee conversion.
8. **Termination:** Lenders do not want the offtaker to be able to escape the long-term purchase obligation under the PPA, since this would leave the project without any revenue to service the project debt. Lenders will pay particular attention to ensure that seller events of default and force majeure events do not allow the offtaker to prematurely terminate the project. If termination does occur, lenders will also want assurances that the project debt will be satisfied.
9. **Remedies upon Buyer Events of Default:** In particular, lenders need the seller to have the ability to exercise certain rights, even up to PPA termination, if the offtaker is failing to make payments or fails to deliver the required payment security.

- 10. Lenders' rights:** Lenders will typically make provision for step-in rights and taking a security interest over project assets via the loan and direct agreements. While the above can provide some useful guidelines, ultimately, bankability is an ever-changing concept. What the lending market accepts (or demands) today may be different from what it will accept (or demand) tomorrow. Given the technology, size, scope, volume and geographical location of power projects, it can be very difficult to ascertain what is truly “market” (i.e., consistent with terms you generally see market participants accepting). Moreover, an experienced developer or sponsor may be better able to persuade lenders to accept provisions that are more friendly to the project company. Alternatively, lenders may be happy to live with a particular provision or risk at the project level, as long as they have a guarantee or other form of credit support (from either the sponsor or offtaker) to cover that risk.

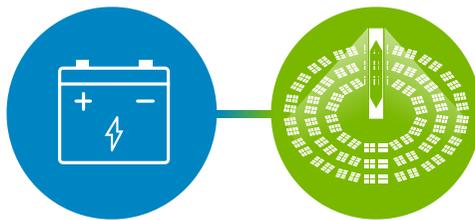
Finally, it is worth noting that some power markets, particularly in developed countries, are sufficiently mature that PPAs are not even required to make a project bankable. This is often the case with merchant power plants (those that do not benefit from a dedicated buyer) where a project can be developed on the basis of independent reports indicating the existence of sufficient expected spot market demand. Once the project is completed, the plant will simply sell into the spot market. However, even in the most developed markets, the absence of a long-term PPA can result in higher interest rates for the project. A conventionally bankable PPA remains an essential tool in virtually every market and ideal in developing country energy markets.

Example: Bankability for Renewable Projects - Concessional Funds

The benefits of renewable power and associated technologies, such as energy storage, come at a cost. These additional costs may make the project unbankable (because revenue will not cover larger principal and interest payments) without unsustainably high tariff payments.

Promoting the uptake of renewable energy generation is an important policy priority for many DFIs. Several DFIs administer climate funds to promote the rapid deployment of these low-carbon technologies which help the sustainable integration of renewable energy generation into grid. These include the \$8bn Climate Investment Funds (the Clean Technology Fund and the Strategic Climate Fund (SCF)) which can provide loans to renewable power project companies at below-market price interest rates (concessional financing) or as loans subordinated to the lenders' senior loans. This improves the capital structure of the investment and the cost of financing, giving the project company's investors a reasonable return on equity, and removing the need for a higher tariff under the PPA. Other funds include the Green Climate Fund, the Global Environment Facility and the Scaling Up Renewable Energy Program (funded by the SCF and supporting smaller scale renewable projects in certain countries).

Example: Energy Storage



5.3. BANKABILITY

At the time of the first edition of this book, the first round of the South African renewable energy IPP program had seen the financing of the 50 MW Khi and 100 MW Kaxu projects. The projects combined concentrated solar power technology with saturated steam and molten salt energy storage to give the plants back-up power capacity of 2 and 2.5 hours of continuous energy generation respectively, enabling them to smooth out intermittency from cloud cover and satisfy the peak demand period in the hours just after sunset.

Molten salt receiver technology has significantly improved the duration of back-up power. The 2015 Crescent Dunes project in the United States has 10 hours of thermal storage; Noor III commenced operations in Morocco in 2018 with 7.5 hours of storage and, as of 2019, the 100MW Redstone CSP/molten salt storage project in South Africa is finalising financing arrangements. If successful, the South African facility will have 12 hours of full-load thermal storage. The capital costs and resulting tariffs for such projects are clearly significantly higher than solar power without storage.

Developed markets have recently seen growth in battery storage (mainly sodium-sulphur and lithium-ion). Examples include the Mitsubishi storage facility commissioned in Japan in 2016, capable of delivering 6 hours of electricity at 50MW and the 129 MWh Hornsdale Power Reserve in South Australia, adjacent to the 315 MW Hornsdale wind farm.

The evolution of affordable and reliable battery storage introduces a new dimension to the structure and pricing of PPAs for the renewable sector. Whereas solar and wind are intermittent by nature, battery storage introduces base load type benefits to the offtaker and the grid operator. These benefits include ancillary services, reserve capacity and frequency regulation.

Ancillary services are the functions that assist grid and system operators in maintaining a reliable electricity system. These services include maintaining the adequate flow and direction of electricity, managing supply and demand discrepancies, and assisting the system to recover after a power system failure.

Reserve capacity is essentially unused but available generation capacity that can quickly be dispatched if other generation resources suddenly become unavailable. To the extent that storage can be used as reserve capacity, the requirement and cost for generation-based reserves are avoided.

5. FINANCING OF POWER PROJECTS

Frequency regulation is an ancillary service that responds very quickly (within seconds) to restore the balance between electricity supply and demand. The primary purpose of frequency regulation is to maintain the stability and accuracy of the system-wide alternating current (AC) frequency within a specific location or area. The benefits of the use of storage in providing frequency regulation include fewer generation start-ups and a reduced need for generation capacity.

In emerging economies, grids and the generators that deliver power to them are sometimes not sufficiently flexible to manage intermittent generation. By introducing storage, renewable projects could greatly assist system operators with grid management and receive additional income for providing these services.

The offtaker and host government will want to take into consideration all of the above factors and the related cost implications in determining the best addition to their current energy generation portfolios.

5.4. Credit Support for Offtaker Obligations

Why Credit Support?

As discussed in the previous section, bankability of a transaction is a primary concern for lenders. An important element of bankability is the level of comfort lenders have with counterparty credit risk, i.e., the risk that the offtaker will be able to comply with its payment obligations under the PPA. The following section provides a high-level overview of the types of support lenders and investors might seek, and the various forms this support can take. For a more in-depth discussion on structuring of this support, please refer to the *Understanding Power Project Financing* handbook.

Generally, there are two specific risks lenders are concerned with: (a) ongoing payment support of PPA obligations (covering capacity and energy payments), also known as liquidity support; and (b) termination support to ensure that at a minimum, lenders' debt and interest is paid following termination of the PPA. More detail on the events and triggers for PPA termination can be found later in the Default and Termination chapter.

Liquidity Support

In the event that an offtaker fails to make its ongoing payment obligation to the project company, short-term payment or liquidity support enables the project company to remain solvent and continue its operations, including servicing its debts. In general, lenders expect the equivalent of three to six months of payment period to be covered by liquidity support depending on the offtaker's financial health. Such liquidity support cover is

finite — once exhausted, if the offtaker fails to make a required payment under the PPA, an offtaker, or buyer, event of default will be triggered. Forms of liquidity support are:

Escrow Accounts

An offtaker can mitigate short-term liquidity risk by depositing cash into an account (either a reserve or escrow account) in a deposit bank. The account is funded to cover a specified amount of ongoing PPA payment obligations. If the offtaker fails to make a required payment under the PPA, then the project company can draw on this escrow account, allowing the project company to continue its operations. The offtaker will be expected to replenish the escrow account within the specified period in an escrow agreement. This solution requires the offtaker to have excess cash it can ringfence or have sit in a reserve account earning minimal interest, which is often not the case.

Letters of Credit

A liquidity letter of credit (LC) is posted by a commercial bank and maintained by an offtaker that can be drawn upon by a project company if the offtaker fails to make a payment when due. In order for a commercial bank to issue these on demand LCs in favor of an offtaker's payment obligations, the commercial bank will require a back-to-back reimbursement and credit agreement to be signed with the offtaker. In the event of non-payment to the project company, the LC maybe drawn.

Lenders will require that the commercial bank issuing the LC be of a minimum investment grade to mitigate the risk that the issuing bank is unable to honor the payment request under the letter of credit. In some jurisdictions an eligible commercial bank may not be available, or cost-prohibitive. Alternatively, the credit risk of the offtaker may be so high that an eligible commercial bank is unwilling or unable to take the offtaker's counterparty risk, or only willing to do so for prohibitively high fees.

A DFI partial risk guarantee can be used to credit enhance an offtaker's credit risk. A more in depth discussion about this product, including how it is used in structuring, its benefits and challenges, can be found in the *Understanding Power Project Finance* handbook.

Support for Termination Payments

Support for termination payments allows lenders to take a view on whether the offtaker will be able to perform its obligation to pay termination compensation. This support can be provided for in various agreements. Sometimes, the offtaker commits to the payment of the termination compensation in the PPA and that obligation is guaranteed by the host government in a government support agreement or sovereign guarantee, implementation agreement, or concession agreement. In other cases, the obligation to pay termination compensation is a direct contractual obligation of the host government within an implementation agreement, concession agreement, or put and call option agreement (PCOA).

While the forms of the various documents containing sovereign support may differ, in essence, any such document will be bankable provided it contains an undertaking from the host government to pay directly, or to guarantee payment by the offtaker of, compensation payments in case of termination of the PPA that are sized to at least cover all outstanding debt (and related costs). Where the form of credit support for ongoing payments by the offtaker is a host government guarantee, this may also be included in this agreement.

Access to sovereign credit support in the event of a termination event facilitates lending since there is recourse to the host government for the termination payment. These host government obligations can be further credit enhanced by way of DFI provided financial instruments such as a payment guarantee or political risk insurance.

For further details on the different forms of sovereign support see Chapter 6 (Sovereign Support) of *Understanding Power project Financing*. Termination payments are discussed further in the *Default and Termination* chapter.

Summary: Range of Host Government Support

Liquidity Support

Type	Key Features
Escrow accounts	Specified accounts set up and funded by offtaker/ government for the benefit of a project company
Liquidity letter of credit	Covers offtaker's payment obligations up to a defined amount

Termination Support

Type	Key Features
Implementation or concession agreement	Project company right to termination payment and other compensation
Government guarantee	Guarantees (a) offtaker payments and/or (b) termination compensation
Put and Call Option agreement	Government call option to purchase and project company put option to sell shares in project company or project assets in exchange for termination compensation
Comfort letter	Issued by government in favour of project company and/or lenders. Unlikely to be bankable unless it creates binding obligations on the host government.

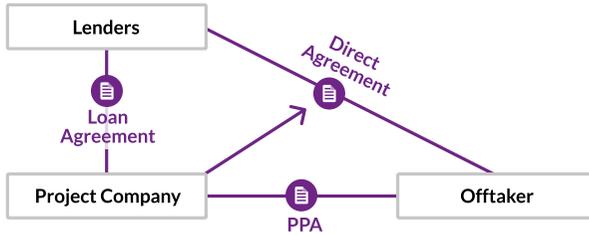
5.5. PPA Direct Agreements

A PPA direct agreement sets out the offtaker's acknowledgement of the security interests granted by the project company to the lenders with respect to the project company's rights and interests under the PPA, and the lenders' rights to take remedial action (including taking over the project) in a default situation. These rights are referred to as **step-in rights**.

The direct agreement should be expected to include the provisions described above, including notices to lenders, extended cure periods, step-in rights, and the right to novate the PPA to a substitute entity to the extent not already sufficiently covered in the PPA. The direct agreement will be entered into by the offtaker, the project company, and the lenders, and establishes a direct contractual relationship between the lenders and the offtaker.

Whilst the primary obligation to obtain financing falls on the project company, the offtaker is generally expected to agree to amend or clarify the PPA as reasonably requested by the project company's lenders. Ideally, such amendments and clarifications are introduced prior to the signature of the PPA by the project company and the offtaker. However, even if the PPA has been signed, the offtaker can still be expected to agree to certain amendments and clarifications to the PPA. The lenders may refuse to lend if this is not done. Where the PPA has already been signed, such modifications will either be incorporated by way of an amendment to the PPA, or through the direct agreement.

5. FINANCING OF POWER PROJECTS



Direct agreements are similarly used between the lenders and the other major project participants. For each project agreement, there may be specific considerations to be addressed. Provisions that may be relevant for direct agreements in other project agreements, but typically not the PPA, include, amongst many other things: licensing rights, land issues, and the supply of spare parts or raw materials.

5.6. Summary of Key Points

Project Finance & Bankability

- **Project finance:** Type of financing in which sponsors/developers invest equity and lenders provide long-term debt to the project company based on (a) the calculated (contractual) cashflows of the project and (b) the underlying power asset value.
- **High capital costs:** Power projects are large and expensive, and require significant capital. A well drafted and balanced PPA is necessary to attract this level of financing.
- **Bankability:** The concept of bankability is continuously evolving and will change depending on the context of the project, evolution of the technology, host country regulation and lender perception of the associated risks. Nevertheless, it should be carefully considered to avoid the failure of a power project.
- **Payment Security:** Parties often put in place mechanisms to prevent interruptions to the projected stream of payments under the PPA.
- **Security Interest:** The lenders will require a security interest over the assets of the project to secure the revenue of the project. Lenders will also require step-in rights in the event of failure by the project company to fulfill its contractual obligations.

Offtaker Credit Support

- **Offtaker credit support:** The host government will typically provide some form of credit support to the offtaker to improve the bankability of a power project. This may include a combination of sovereign guarantees, comfort letters, put-and-call option agreements, letters of credit, and escrow account provisions to provide payment liquidity and foreign currency availability.

- **Political risk cover:** Depending on political risk concerns in the host country, project lenders may require partial risk guarantees from multilateral development banks or other development finance institutions to provide additional investment protection under the PPA. Investors will in most instances purchase insurance to protect their equity investment over the long term.

Direct Agreements

- **Direct agreement:** The offtaker will be required to enter into a direct agreement with the lenders. This agreement provides comfort to the lenders that they will be notified in the event of a project company's default and that they will have the right to intervene before the PPA is terminated.
- **Step-in rights:** Under a direct agreement, lenders will have step-in rights which will allow them to take control of the project company in the event of a project company's default.

6. Financial Provisions

6.1. Introduction

A PPA is an agreement to purchase power. The question is, how much is being purchased, at what price, and when is payment due?

The financial terms are based on the tariff (see the *Tariff Structures* chapter), which is typically a pricing formula based on the capacity, availability and/or energy delivered by a power plant. The tariff is established through the procurement process (see the *Procurement of Electricity* chapter), whether through a competitive tender or through direct negotiation. The details of invoicing and payment (see the *Invoicing and Payment* chapter) determine how and when payment from the offtaker is due. Any special tax treatment such as tax exemptions (see the *Tax Exemptions* chapter), can impact a project's commercial viability and the cost of power.

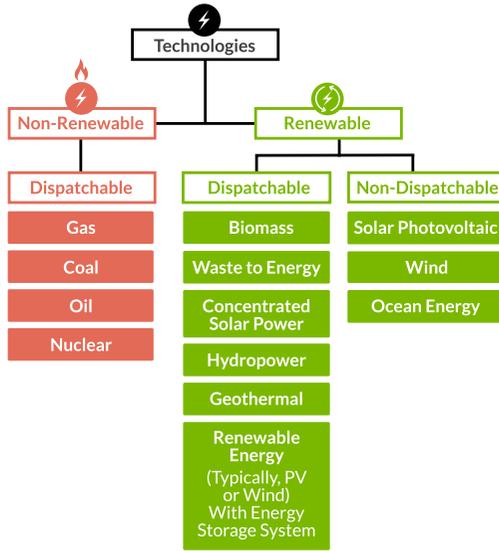
The financial provisions of a PPA are often the most heavily negotiated, with these negotiations typically requiring input from the project company, its investors and lenders, and all government ministries that have a role in financial oversight of power projects (regulator, ministry of power, ministry of finance, tax authority, etc).

6.2. Tariff Structures

The tariff is one of the most important aspects of any PPA. When used in this chapter, the term **tariff** is understood to include a few components. First, it encompasses the actual price that the offtaker pays to the project company for capacity made available and/or energy generated. The currency unit used is usually determined by regulation, availability of foreign currency, the currency of the EPC agreement, or the currency in which the loans are denominated. The tariff also includes the broader set of terms and conditions that surround the price. These other terms determine the amount of money the offtaker will pay to the project company each month. This section will explain:

1. The types of tariff structures (capacity-based vs. non-capacity-based) that are commonly found in PPAs.
2. The methods that can be used to establish the price per unit of capacity that is made available and/or per unit of energy that is generated.
3. How **take-or-pay** obligations under fuel contracts impact and should be reflected in the tariff that is payable under the PPA.
4. How the length of the term of a PPA impacts the tariff.
5. How deemed energy can be calculated.

Different tariff structures are used for dispatchable and non-dispatchable technologies.



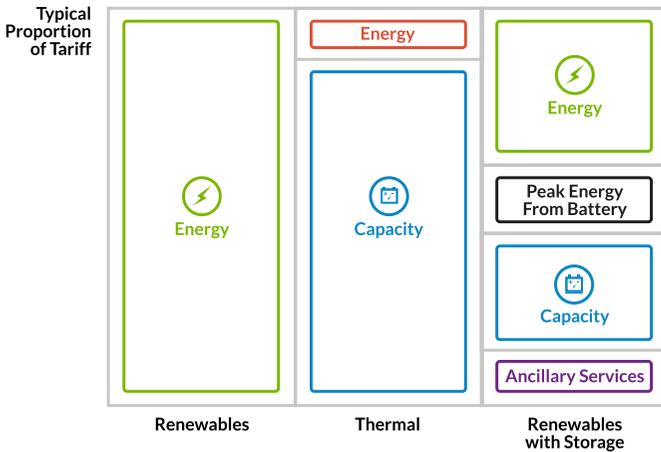
Dispatchable technologies refers to those technologies that can be dispatched by the offtaker. This means that the offtaker can (and indeed must) deliver instructions to the project company that directs it to generate a specific quantity of energy (or power) during each settlement period. Examples of dispatchable technologies include all types of thermal generation facilities such as gas turbines (whether single or combined cycle), reciprocating engines that are fueled by gas, diesel or heavy fuel oil, coal-fired generation facilities, and hydroelectric facilities (other than most run-of-river facilities).

Non-dispatchable technologies refer to those technologies that cannot be dispatched by the offtaker, but are instead fed into the network as and when the energy is available. In general, all renewable technologies other than large (dam-based) hydroelectric are non-dispatchable. Examples of non-dispatchable technologies include wind and solar. The energy must be

6.2. TARIFF STRUCTURES

generated using the renewable resource when and to the extent that resource is available or (in the absence of any storage capacity associated with the plant (see the storage case study in *Bankability* section) the energy will be lost). Although storage may help deal with intermittency, it will not make renewable power dispatchable (because of the remaining risk that adverse weather conditions will persist beyond the storage system capacity).

As a result of this defining characteristic, very different tariff structures are used for dispatchable and non-dispatchable technologies. The two sections below describe the two different types of tariff structures that are commonly used in connection with dispatchable and non-dispatchable technologies.



Tariff Structures for Dispatchable Technologies

Tariff structures have evolved over the years in different jurisdictions toward greater efficiency in allocating energy resources and refining payment mechanisms to incentivise investment. The first tariffs combined the energy and capacity elements into a single energy charge (usually stated in dollars per kWh). The next generation of tariffs added a **take-or-pay** requirement to essentially guarantee a floor to the level of expected dispatch. The third generation of tariffs eliminated **take-or-pay** concepts from electricity tariffs (except to the extent required to reflect any take-or-pay obligations under the fuel supply agreement that must be passed through) and introduced capacity and energy payments.

Capacity-based tariffs were developed to address the drawbacks that are inherent in the energy-only and take-or-pay structures. These tariffs are structured to balance the interests of investors and consumers in an economically efficient manner. The offtaker's interests are protected because the offtaker is only obligated to pay for the capacity that is made available to it, plus the energy that is dispatched by the offtaker and actually delivered to the delivery point.

In general, these tariffs provide that the offtaker will pay to the project company each month:

- A charge (the **Capacity Charge**) for the capacity of a power plant that is made available to the offtaker, regardless of whether the offtaker actually dispatches the power plant; and
- A per MWh (or per kWh) charge (the **Energy Charge**) for energy that is dispatched by, and delivered to, the offtaker.

The **Capacity Charge** is sized to enable the project company to earn revenues under the PPA that are sufficient to enable the project company to:

1. Repay the project loans (and in some cases associated infrastructure such as transmission lines).
2. Pay the sponsors a return on the equity and quasi-equity (such as shareholder loans) invested by them (and, in the case of a project company that is structured on a build-operate-transfer basis, return the equity and quasi-equity invested by the sponsors over the term of the PPA).
3. Pay all corporate and other taxes that are assessed on the project company and its properties.
4. Pay for fixed operations and maintenance costs and any other agreed project costs that will be incurred by the project company regardless of the dispatch factor.

The **Energy Charge** is sized to enable the project company to earn sufficient revenues under the PPA to allow the project company to: (a) recover the cost of any fuel used to generate the energy dispatched by, and delivered to, the offtaker; and (b) pay for any operation and maintenance costs that vary depending on the quantity of energy produced by the power plant.

As a result of this tariff structure, the project company is indifferent to actual dispatch levels because the project company's capital and fixed operations and maintenance costs are recovered through the Capacity Charge, which is payable regardless of the level of dispatch. As a result, it is not necessary for the project company to charge a risk premium to bear market risk. At the same time, this tariff structure reflects the true nature of project company costs and is consistent with the principles of economic dispatch.

The Capacity Charge is stated as a price (sometimes referred to as an **Hourly Base Capacity Price**) for each MW that is made available (whether or not that MW of capacity is actually used to generate energy) over a settlement period. Each settlement period is weighted to reflect the importance of the availability of capacity during that hour to the offtaker. The charge paid for each hour can be stated as:

$$\text{HCP} = (\text{BCP}_i + \text{FOMC}_i) \times \text{PWF}_i \times \text{AvCap}_i$$

where:

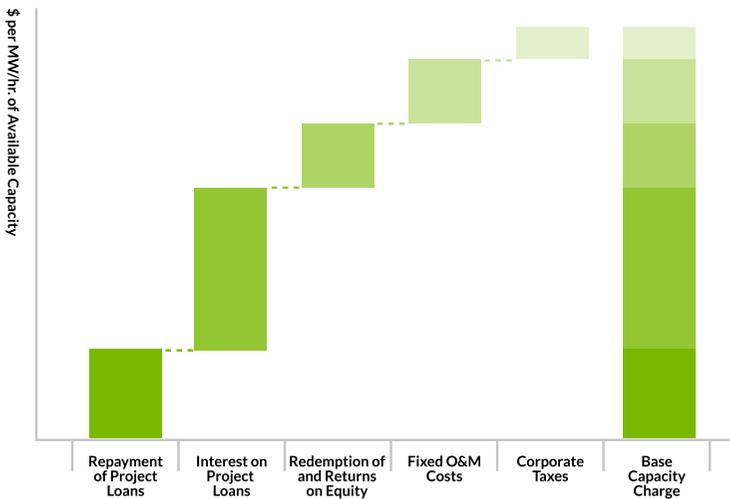
- HCP - means the amount of the Hourly Capacity Payment for hour 'i';
- BCP_i - means the amount of the Base Capacity Price for hour 'i'
- FOMC_i - means the amount of the Hourly Fixed Operations and Maintenance Charge for hour 'i';
- PWF_i - means the period weighting factor for hour 'i', (which is a number within a range of, for example, 0.65 and 1.5, that reflects the importance of the capacity during that settlement period); and
- AvCap_i - means the capacity that is declared to be available during hour 'i' by the project company.

The Hourly Capacity Payments that are payable during each hour of a month (month '*m*') are then summed to determine the monthly Capacity Payment. In this manner, the offtaker only pays for capacity that is actually made available to it. Although the tariff will contain many formulas and will address many matters that are not addressed above (for example, ancillary charges, start-up costs and other supplementary items), this formula, which captures the most important elements, provides an example of how the key concepts on which a modern capacity-based tariff can be stated. It is however, useful to note that other provisions of the PPA will adjust AvCap_i downwards in the event that the project company declares that more capacity is available than the project company can actually deliver during hour 'i'.

It is also useful to note that in the event that the project company is not able to make capacity available due to risks that the offtaker has agreed to bear, then the capacity will be deemed to be available to the offtaker. Examples of such risks include risks related to the availability of the transmission system to take energy from the power plant, the availability of fuel (if the offtaker is responsible for providing fuel), and political force majeure events.

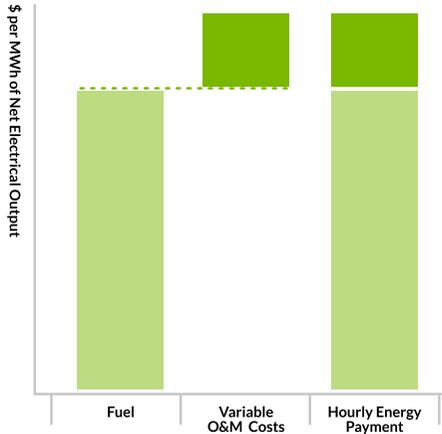
The illustration below shows the principal components that make up a Base Capacity Charge and shows (in general terms) the relative size of each such component at the beginning of the term of a PPA. During later years of the term, the interest on project loans component will decrease (assuming straight-line amortization). This decrease is offset by increases to the repayment of project loans and redemption of and return on equity components.

Key Components of a Base Capacity Charge



The illustration below shows the principal components that make up the Energy Charge under a capacity-based tariff for a thermal power plant.

Key Components of the Energy Charge



Key Points

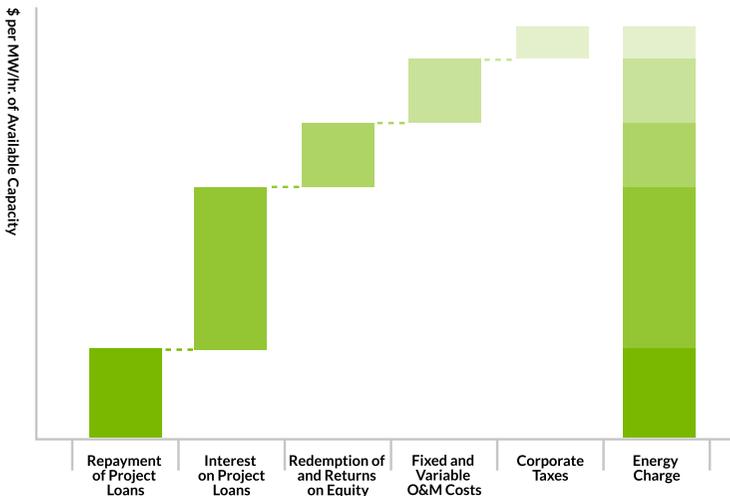
- Capacity payments allow for project companies to recover their fixed costs (capital costs and fixed operating costs) and agreed-upon profits. These charges are paid so long as the power plant is made available for dispatch.
- Energy payments account for fuel and variable operating costs.
- In some jurisdictions, supplemental charges are imposed on the buyers for grid system requirements (such as start-up charges, cost of ancillary services, and any charges for force majeure events that are the offtaker's responsibility under the PPA).

Tariff Structures for Non-Dispatchable Technologies

Typically, PPAs for non-dispatchable technologies (primarily renewables) require that the project company deliver and sell to the offtaker all of the energy generated by the generation facility. The price is stated in simple terms such as cents (or other currency unit) per kWh or dollars (or other currency unit) per MWh generated and delivered.

The Energy Charge under an energy only tariff on a renewable project will contain the following components:

Key Components of an Energy Charge



Deemed energy before actual COD

Non-dispatchable renewable plants will also be entitled to deemed energy payments in case of deemed completion (see section *Deemed Completion*). For solar and wind projects, the widely applied formula for determining deemed energy payments from scheduled COD until actual COD is calculated against the solar or wind resource, and the energy yield potential of the particular site. Typically, P50 and P90 probabilities are used to judge the reliability of the solar or wind resource of a project.

A P50 figure is the level to which the forecasted generation is expected to be exceeded for 50% of the year. This translates to the average, since half of the year's energy output is expected to exceed this level, and the other half is expected to fall below this forecast. The probability of reaching a higher or lower annual energy production is therefore 50:50.

A P90 figure is the level to which the forecasted generation is expected to be exceeded with 90% probability. This is the more conservative estimate. Lenders and investors typically use P90 estimates to be confident that sufficient energy is generated to allow a better safety net for the repayment of project debt.

Thereafter, following completion testing, if the plant performance tests demonstrate a lower-than contracted capacity, the project company will typically need to account for the difference.

Deemed energy after actual COD

These tariffs also recognise that there will be times when either the offtaker or the transmission system operator may **curtail** the production of energy at the facility due to constraints on the grid, emergencies, or for other reasons. Different markets allocate the financial risk for curtailment losses differently. In emerging market PPAs, the offtaker will cover

curtailment losses as part of the tariff. Often, this is limited to curtailment losses that go over a pre-determined threshold. The curtailed energy will be one form of deemed generation. Deemed generation also arises in the case of grid unavailability.

The main reasons that require the offtaker of a non-dispatchable plant to pay for deemed generation are:

- The likelihood of a prolonged curtailment is more significant for various reasons, including the condition of the transmission system and the likelihood that an excess of generation will trigger a network-wide blackout because of an imbalance between supply and demand resulting in grid instability.
- The host government may have a controlling interest in both the offtaker and the transmission system operator. In this case, investors will be concerned that the offtaker may cause the transmission system operator to curtail generation in the event that the offtaker may purchase energy at a lower price from other sources.

The risk of prolonged curtailments has led to the development of more robust methods for calculating deemed generation quantities in emerging markets. This is a logical response to the risk of prolonged curtailments, because, during a prolonged curtailment, the total amount of deemed generation payments can be very large, and they will depend heavily on the deemed generation formula and the measuring equipment.

As an example, a PPA for a wind project would typically require the project company to construct one or more meteorological masts to measure the average speed and direction of the wind during each period of six minutes occurring during a billing period. Prior to the commercial operations date, the offtaker and the project company would develop (with the approval of the independent engineer) a *power curve* that predicts, for each wind speed and direction, the net electrical output the wind farm can generate under those conditions. The power curve would be updated annually or semi-annually based on the actual performance of the wind farm. When a

curtailment occurs, the power curve could then be used, together with data on the wind speed, wind direction, and the availability of each wind turbine generator during the duration of the curtailment, to calculate the quantity of deemed generation for which the offtaker will be required to pay. Similarly, a PPA for a solar project would require the offtaker and the project company to develop a power curve that is based on the solar insolation measured by one or more pyranometers or pyrhemometers (which measure the direct and indirect irradiance and the direct radiance striking a plane, respectively). In recent years Cape Verde, South Africa and Kenya have each signed PPAs, some of which feature the above provisions for wind-generating assets. Some of these units have entered commercial operations.

After COD, the deemed energy payments of a renewable power plant can be calculated using the power model developed by the project company for the power plant, which is often required to be approved independently by an engineer, and which predicts the energy output of the power plant, based on its operating regime and the atmospheric conditions.

Key Points

- Energy-only tariffs are stated in \$/kwh or \$/MWh (but they may also be stated in a local currency).
- The principle of deemed energy applies from scheduled COD.
- Careful measurements are taken by buyer and seller to determine/verify the level of deemed energy for which the offtaker is obligated to pay.

Feed-in Tariffs

Feed-in tariffs or FiTs are commonly used to incentivise the production of energy from renewable resources. The distinguishing feature of FiTs is the setting of a fixed tariff, possibly differentiated by technology. For a greater discussion of FiTs and how they compare to other forms of procurement, please refer to the handbook *Understanding Power Project Procurement*.

A feed-in tariff is generally understood to provide certainty as to three key terms for a producer. Those three terms are: (a) guaranteed access to the grid; (b) long-term PPAs; and (c) an energy price that is effectively subsidised.

The energy price is usually established by the sector regulator through an evaluation of: (a) the capital costs and operations and maintenance costs that a reasonably efficient project company would incur in connection with the development, construction, operation and maintenance of a power plant that is based on a particular technology (such as wind or solar); and (b) the capital structure that a project company should be able to achieve.

Feed-in tariffs are generally established, and remain valid for a defined term, so the project company is certain that it will be able to recover, and earn a reasonable return on, its investment in the project. As a general rule, all project companies (subject to a pre-determined cap on the quantity of capacity that is eligible under the feed-in tariff) that achieve commercial operations or start construction by a pre-determined date are eligible for the feed-in tariff for the term of their contract.

Regulators periodically revise the feed-in tariffs that are applicable to new projects, with the objective of reducing the feed-in tariff to capture lower capital costs and other costs savings that have resulted from the more widespread adoption of that particular technology. Photovoltaic solar projects provide the best example of the trend towards lower costs; since

2008 the price of photovoltaic panels has dropped steadily and dramatically, leading to solar tariffs falling below those for thermal power plants in some jurisdictions.

Feed-in tariffs are generally structured in a manner that is consistent with the tariffs described above in the section titled *Tariff Structures for Non-Dispatchable Technologies*.

Take-or-Pay Obligations under Fuel Contracts -Implications for Electricity Tariffs

In a number of emerging markets, gas suppliers usually insist that long-term gas supply agreements contain a take-or-pay clause. In the context of a project company, a take-or-pay clause provides that the project company must purchase an agreed quantity of gas (usually stated in MMBtus or GJ (LHV)) each year, or pay for that quantity of gas regardless of whether the project company purchases the full amount.

The economic rationale for a take-or-pay clause in a gas supply agreement is two-fold. First, the gas supplier will have the right to extract gas from the reservoir(s) from which it is supplying gas, for a defined and limited period of time that is set out in its exploration and development licence, over the blocks that include the relevant reservoir(s). If the gas supplier were to sign a long-term gas supply agreement with a project company, and the project company were to fail to purchase a significant proportion of the reserves the gas supplier dedicated to the project company, then the gas supplier would lose some of the economic value represented by its investment in exploration, field capital costs, gas processing facilities, and other infrastructure. Second, in order to service its own debts, the gas supplier needs a consistent revenue stream. The take-or-pay obligation is the mechanism that gas suppliers use to control these risks.

6.2. TARIFF STRUCTURES

In spite of the economic rationale behind them, take-or-pay obligations should be treated with care, because they can impact the tariff that is payable under a PPA. Every take-or-pay obligation should soften the potential consequences for the purchaser of the gas (in this case, the project company) by including carry-forward and make-whole provisions. A make-whole provision provides that if the gas purchaser fails to purchase the take-or-pay quantity during any take-or-pay period (which is almost always a period of one year), and pays a take-or-pay payment equal to the purchase price multiplied by difference between (a) the take-or-pay quantity, and (b) the quantity of gas consumed, then the take-or-pay payment can be credited towards the cost of gas in a subsequent take-or-pay period, once the take-or-pay quantity has been consumed during that period. A carry-forward provision does just the opposite. It provides that if the gas purchaser purchases a quantity of gas in excess of the take-or-pay quantity during a particular take-or-pay period, then the carry-forward quantity (the quantity of gas purchased in excess of the take-or-pay quantity) will be used to reduce the take-or-pay quantity in subsequent take-or-pay periods.

Take-or-pay obligations impact the tariff that is payable under a PPA in the following manner. In the event that the offtaker fails to dispatch the project company at a level that would enable the project company to consume a quantity of gas equal to the take-or-pay quantity during a take-or-pay period, then at the end of that take-or-pay period, the offtaker will be required to make a payment that enables the project company to pay the take-or-pay payment to the gas supplier.

For gas-fired power projects, the gas supplier may be any of: (a) an exploration and production company that holds the rights to produce gas from a particular field or group of fields; (b) a national oil company or state owned gas aggregator that purchases gas from exploration and production companies and markets and sells that gas within the country or the region; or (c) a supplier that imports LNG, regasifies it in a regasification facility and markets and sells the gas. The purchaser will be the project company. The gas may be transported from the gas processing facilities or regasification facilities through a pipeline under a transportation agreement between the pipeline operator and either the project company or the gas seller.

Key Highlights

- Take-or-pay provisions are necessary in long-term fuel supply contracts because they lower the risk for parties who bring fuel and generation assets to the market.
- Take-or-pay provisions may have the effect of increasing tariffs during certain months that coincide with the end of a take-or-pay period, thereby squeezing the liquidity of an offtaker who makes take-or-pay payments for energy not used.

Tariffs and Bankability

Regardless of the tariff structure chosen for the PPA, the methodology for calculation of the tariff must be clear and fixed for the term of the power purchase agreement. Any change to the tariff must be made in accordance with adjustment mechanisms that are agreed up front in a binding agreement and signed off on as part of the seller's and lenders' due diligence process.

Refinancing

After COD, a project company may seek to refinance its loans. For the project company, this could result in a reduction in the cost of debt, thus increasing equity returns. For the offtaker, if the steps below are taken, its share of the cost savings derived from refinancing could be used in achieving tariff reduction, benefiting the consumers in the country. Refinancing could also be a strategy for substituting foreign currency debt with local currency debt, thus significantly reducing concerns about foreign exchange fluctuations over the term of the PPA.

Elements of refinancing have been dealt with in the handbook *Understanding Power Project Financing*.

Refinancing to reduce the tariff

Two things need to happen to enable the offtaker (and ultimately consumers) to benefit from cost savings that could arise from a refinance post COD:

1. The project company needs to be incentivised to go through the time-consuming process of refinancing. If the tariff simply passes through the cost of debt to the offtaker, the project company has no reason to seek to reduce that cost. A PPA that considers alternatives to a complete “pass through” of the debt finance cost will better cater to this opportunity.

2. The offtaker should ensure that the PPA includes a benefit-sharing mechanism under which any saving from the reduced interest rate is shared, e.g., 50-50 between the project company (by way of increased return) and the offtaker (by way of reduced tariff). The precise division of the benefit will be a matter for negotiation, but it's important to note that the decision to refinance its with the project company. The project company's willingness to undertake the cost of refinancing its loans, including incurring penalty costs for breakage fees with existing lenders, will be balanced against the net benefit of increased returns.

Refinancing to reduce foreign exchange risk

As already discussed, there is often a mismatch between the currency in which the PPA tariff is denominated or indexed, usually a reserve currency, and the local currency that the offtaker receives from its resale of electricity. This mismatch of reserve currency obligations can create ballooning financial obligations for the offtaker if the local currency depreciates against the reserve currency during the term of the PPA.

Because of liquidity constraints and limits on tenor, local banks who are best placed to fund in local currency are usually unable to provide competitive financing for the duration of the loan required for a project to be bankable. However, they can be better positioned to refinance a project post-COD, which can realign the offtaker's payment obligation with their funding source.

Two things need to happen together to enable the offtaker to benefit from a local currency refinancing post COD:

6.2. TARIFF STRUCTURES

1. As above, the project company needs to be incentivised to go through the time-consuming process of seeking local currency refinancing. Since the offtaker is the primary beneficiary of a local currency refinancing because it will be able to better manage its cash, the offtaker may need to offer a higher tariff or other form of financial incentive to the project company to compensate the cost of undertaking a refinance. The net benefit to the offtaker should be the cost savings from protecting itself against currency volatility.
2. The negotiated arrangement which allows the project company to benefit from a financial incentive should it successfully refinance in local currency should be captured in the PPA from the beginning. In addition, the PPA should capture that at the time local currency refinancing is achieved, the PPA obligation should convert to a local currency-denominated PPA.

Offtakers will want to consent to any changes in financing terms which will impact either the cost, tenor, or amount of the loans, especially if the cost of debt is a 100% pass-through in the PPA. They will want control if the proposed refinancing will lead to an extension of their period of risk to repay significant amounts of debt.

Offtakers may wish to ensure that their PPAs are drafted from the start (when leverage is greatest) in such a way as to permit them to obtain these benefits at a later stage of the project. The project company may also wish to ensure that its financing documents permit partial local currency refinancing if the project company wishes to retain the halo effect of a DFI as lender to the project. With a little forethought at the time of drafting the transaction documents, the pay off for the country, in terms of tariff reduction or exchange rate risk avoidance, could be significant.

6.3. Invoicing and Payments

Invoices

In order to be paid for the energy it delivers, plus any applicable capacity charge, the seller will need to periodically invoice the buyer, in an amount denominated in the currency agreed in the PPA. The billing period is generally on a monthly basis. The invoice will generally include the following components: (a) capacity payment, (b) energy payment, and (c) supplemental payments (including payments for any start ups above the agreed threshold). The buyer has the right to review the invoice prepared by the seller, and if it disagrees with the amount payable in the invoice, it may request clarification and substantiation of such invoice within a number of days agreed among the parties.

Metering

An important element after the tariff negotiation is how to measure the energy and capacity to be invoiced to the buyer. The seller is typically responsible for buying and installing meters to measure the output of the power plant. The net electrical output and capacity to be invoiced will usually be measured according to a metering code published by the regulator. The parties will agree on the meters (a main meter and a back-up meter) to be used for measurements, and the delivery points for those measurements. Those meters will be regularly inspected and tested by both parties. Representatives of both parties should generally be present on the date of reading of meters for invoice.

Payments

Undisputed payments must be made in the currency agreed by the parties to the power purchase agreement.

Method of payment: The method of payment is subject to agreement of the parties, but is often by wire transfer to a designated account of the seller.

Disputed amounts: Normally, if any portion of the invoiced amounts are disputed by the buyer, these will be withheld from payment and contested as part of the agreed dispute resolution mechanism under the PPA. An interest rate will apply to all such withheld amounts which must be added to the payment as determined under the dispute resolution mechanism to be owed to the seller. In some cases the parties may agree that the amounts representing the disputed portions of the invoice will be put in an escrow account until resolution of the dispute.

Late payment: Any late payments (i.e., payments made after the due date agreed between the parties) will bear interest at an interest rate (either local interest rate or foreign interest rate) agreed between parties from the date on which the payment is due until the date the payment is made. The basis of the interest rate is generally the inter-bank rate for the monetary market published by the central bank of the country for local currency components or the LIBOR/EURIBOR for US/EUR foreign currency components.

6.4. Tax Exemptions

In an effort to incentivise investment in a sector, host governments may sometimes provide economic incentives in the form of tax exemptions.

Tax exemptions may improve the project's financial viability and encourage investment, allowing a lower tariff that will benefit consumers. Examples of the types of exemptions that may be granted are exemptions from custom import duties and levies on requirements during construction, reduced registration fees, negotiated levels for value added taxes (VAT) and the granting of income tax holidays during the operational period of the project.

Tax exemptions are viewed by some economists as a more efficient form of economic incentivisation than tariff subsidies or other direct payments. Tax exemptions reduce the project capital cost by relieving the project company of tax liabilities incurred through customs duties or income/profit once the project generates revenue. The efficiency may arise due to the closer proximity between the tax benefit and the economic activity. As opposed to a direct tariff subsidy, which would be recorded as a long-term liability of the host government over the life of the PPA (or even across an entire market), tax relief is a single event, in the case of customs duties, or an annual event, in the case of tax holidays, where the host government forgoes tax revenue in favor of lower power tariffs.

Tax and customs exemptions granted to a project will have to be approved by the customs and tax authorities or, if they are significant in size or uniquely tailored, by the legislature or chief executive of the country. This process may take a significant amount of time. Where tax exemptions are contemplated for a power project, the parties will need to take this timing constraint into account during their negotiations. In a competitive procurement scenario, approval of tax and customs exemptions should be obtained prior to the tender, otherwise investors may assume they will never be approved and will price their projects accordingly. In the interest

6.4. TAX EXEMPTIONS

of expedience, host governments are encouraged to implement tax incentives prior to commencement of the bidding processes, as this can reduce project development time and provide economic certainty when bidders prepare their financial models.

Clarifying Tax Incentives: Even where a tax exemption or other special taxation regime is granted by treaty, law or agreement, the project company will want to work with their tax advisors and legal counsel to confirm that such exemptions are understood at the working level by the tax authorities. It is not uncommon to confirm a tax exemption at the start of a project or even reconfirm after personnel changes at the tax authority. In many emerging markets, tax questions around privately owned infrastructure and project finance are “first instance” questions that can only be answered through close consultation between government authorities and tax advisors, so project companies are encouraged to adopt a collaborative approach when these issues arise.

6.5. Summary of Key Points

Tariff structures

- **Dispatchable:** The tariff structure for dispatchable technologies (thermal and large hydro) includes a payment for the capacity made available to the offtaker and a payment for energy that is actually dispatched by the offtaker.
- **Non-Dispatchable:** The tariff structure for non-dispatchable technologies (wind, solar and smaller run of the river hydro) consists primarily of a payment for the energy generated by the generation facility. A feed-in tariff may also be used to incentivise renewable energy projects.

Fuel Supply Agreements

- **Take-or-pay:** Fuel supply agreements usually contain a take or pay clause which provides that the power producer must pay for an agreed quantity of fuel (typically gas), regardless of whether it actually takes that quantity.

Tax

- **Tax Exemptions:** In order to attract investment into power projects, the host government may grant special tax exemptions which extend beyond the general rules applied to all companies.

7. Risk Allocation and Mitigation

7.1. Introduction

The foundation of a successful and bankable PPA is the achievement of an equitable balance and allocation of risks amongst the contracting parties to the PPA. The age-old principle of contractual risk allocation in project financing rings especially true for PPAs, the essence of this principle being that **risks should be allocated to the party best able to manage such risk.**

The management of the risks may best lie with a third party, for example, the contractor who has been appointed to undertake the construction of the power plant, or the transmission company responsible for building the interconnection facilities. However, those third parties are not the contracting parties to the PPA, yet the risk must be allocated to one of the parties to the PPA. So how is this gap bridged?

How such risks are to be mitigated is a necessary consideration within the PPA. Risks within the control of a third party assumed by one of the parties to the PPA may, for example, be passed to such third party through the use of back-to-back provisions in the PPA and the contract with the third party.

If a party takes on risk that is not usually allocated to that party, they will expect to receive some benefit for assuming such risk. In the case of the offtaker, the expectation could be that it would want to receive a lower tariff. In the case of a project company, the expectation could be an appropriate increase in its equity return for bearing that risk. Therefore, whilst a party may achieve a commercial win in passing on risk to its counterparty, that party ultimately is still bearing the cost of such risk in some form or other. An appropriate balancing and allocation of risk in a PPA should aim to provide sufficient incentive to the contracting parties to perform their obligations under the PPA.

7.1. INTRODUCTION

Some risks are present throughout all phases of a project. Certain risks arise only during the development and construction phase, while others arise only once the project is operational.



This chapter seeks to explore the key risks that arise in the context of a PPA. The risks outlined in these chapters are not exhaustive. Risks and methods for their mitigation may also vary from project to project, depending on the jurisdiction, the underlying regulatory framework, the structure of the offtaker, and the particular generation technology, amongst other considerations. These various permutations are touched on in other chapters of this handbook.

7.2. Development and Construction Phase Risks

Pre-Construction

Land Procurement

The project company will typically bear the primary responsibility to procure the land on which the power plant will be developed and operated. To the extent that the offtaker and/or host government owns, leases, or grants a concession over such land, and is making such land available to the project company, then the responsibility may sit more appropriately with the offtaker. Similarly, where a government authority or entity controlled by the government or offtaker is the lessor of the project site, the project company will often seek additional comfort from the offtaker/host government with respect to compliance with the terms of the lease arrangement. It is in the interest of both the offtaker and the project company to ensure that the right to occupy the project site is secured for the entire term of the PPA, since any risk around land access/tenure will impact the ability to raise long-term financing. If the term of the PPA can be renewed, then the right to occupy the project site should be secured for the extension period.

Failure to Commence Construction

The offtaker will want reassurance that the project company will commence construction activity within a minimum period of time after the effective date of the PPA. Although the failure to commence construction may not be a direct result of the project company's acts, such as when an EPC contractor fails to execute its duties under the EPC

contract, the potential liabilities associated with this form of default still rest entirely with the project company. Failure to commence construction within the defined time period will either cause the PPA to terminate automatically, or give the offtaker the right to terminate the PPA. The project company's failure to commence construction may also trigger payouts under construction or performance bonds.

There are only limited opportunities for a project company to cure a failure to commence construction. Some PPAs may provide the project company with the option to extend the commencement period, while at the same time paying liquidated damages to remedy the initial delay. If the delay is caused by a force majeure event (including a political force majeure event) or by a default by the offtaker (or any related party or governmental authority under any other project contracts), the time limit for commencement of construction will be extended, usually on a day-for-day basis. This extension will continue for so long as the relevant force majeure event or default prevents the project company from commencing construction.

In markets where the offtaker requires the commercial operation date to occur within a prescribed time frame, for example where the offtaker anticipates an increase in demand that exceeds current supply due to near term population or industrial growth, it would be important for the offtaker to have the ability to exit the PPA at an early stage if the project company has failed to commence construction, and to procure another project company to develop such project. This mechanism is suitable to renewable energy projects in highly competitive markets where a replacement project developer can be more easily procured.

Construction

Abandonment

Following commencement of construction, the offtaker will also want to be sure that construction is proceeding and that the project has not been abandoned. Abandonment could take the form of a permanent suspension of the project's construction or operation, or could occur via constructive abandonment, where construction or operation has been suspended for a protracted period of time. In either case, abandonment of the project will constitute an event of default by the project company, entitling the offtaker to terminate the PPA. After the project is operational, the concept of abandonment and the applicable time period will vary, depending on the technology of the project, in order to account for different levels of intensity of the operation (for example, active management of a thermal plant vs. passive management of a solar installation).

Delays in Achieving COD

Construction of the power plant within an agreed time schedule is one of the primary obligations of the project company under the PPA. Accordingly, failure to complete the plant (i.e., achieve COD) within the applicable timeframe will, in the absence of force majeure or other relief events, constitute a breach of the PPA, entitling the offtaker to claim delay-liquidated damages and/or ultimately, to terminate the power purchase agreement. The project company will, in turn, need to ensure that any obligation to pay delay liquidated damages is passed through to the EPC contractor under the EPC contract (in which delay liquidated damages will need to be sized to cover not only those payable under the PPA, but also project company operating cost and debt service under the loan documents). The EPC contract should also provide that, upon termination of the PPA for prolonged delay, the project company is entitled to terminate the EPC contract and claim appropriate compensation (including a full rejection right and repayment of the full contract price).

Where the offtaker is willing to absorb some delays (for example, in case of renewable energy projects) there are additional options for structuring penalties for a project company's delay in construction. One option is to penalise the project company by reducing the term of the PPA for each day of delay, thereby reducing the project company's expected revenue over the term of the PPA. This could extend to adding a factor for each day of delay (for example, the term can be reduced by two days for a day of delay effectively translating to a reduction of three days of the term of the PPA). Where offtakers want the lowest tariff possible, and are willing to absorb some delays, they should be cognisant that delay-liquidated damages could result in increased costs or even, if very high, make the project unbankable. The security required to cover the payment of delay-liquidated damages (e.g., some sort of bond) will be another added cost to the tariff. The important principle is that the penalty should incentivise the project company to perform in terms of the timelines agreed to in the PPA.

Deemed Completion

There are a number of circumstances in which the project company (and its contractors) must be entitled to claim relief for delays. Relief may be given with respect to time only (i.e., the project company is given a time extension only), or both time and money, through the concept of **deemed completion**. Deemed completion occurs where completion is not achieved as a result of risks for which the offtaker (and/or government) bears the risk. In such circumstances, deemed completion will typically be held to have occurred on the later of the relevant scheduled completion date and the date on which the plant would, but for the relevant risk event, have occurred. Upon deemed completion, the project company will be entitled to receive capacity payments sized by reference to the contracted capacity of the power plant. In the case of non-dispatchable technologies such as renewable energy, where no capacity payment is payable, the project company shall be entitled to deemed energy payments between scheduled COD and actual COD. Thereafter, following completion testing,

if the plant performance tests demonstrate a lower-than-contracted capacity, the project company will typically need to account for the difference.

Construction Cost Escalation

From the offtaker's perspective, one of the key objectives in tendering out or negotiating a power project for development by the private sector, is to establish price (and therefore tariff) certainty with respect to the capital cost of the project. The tariff will therefore be determined on the basis of a competitive bid or an agreed construction cost. The project company will in turn typically look to lock in the construction cost by negotiating a lump-sum, date-certain, turnkey contract with its EPC contractor. Thereafter, the basic principle is that the project company (under the PPA) and the EPC contractor (under the EPC contract) will bear the risk of any cost overruns. There are, however, certain exceptions to this rule. Where the construction cost increases as a result of a variation required by the offtaker or changes in law (see *Change in Law* below), the PPA should allow either for direct compensation to be payable by the offtaker to cover the incremental cost in construction, or for the tariff to be adjusted to cover the incremental capital cost (and any associated financing cost).

Site Access and Availability

There are a number of potential risks and issues associated with construction that relate to the site selected for the project. These include geological risk (i.e., whether the site is geo-technically suitable for the construction activity); archaeological risk (the possibility of archaeological discoveries being made during excavation/construction, and how such discoveries are managed); and any pre-existing environmental contamination that may be discovered during construction activities.

Right to Occupy

The project company's right to occupy the project site for the purposes of constructing and then operating the power plant is fundamental to the integrity and viability of the project. That right may take a variety of forms, ranging from outright ownership of the project site (potentially through acquisition from a third party), different forms of leasehold interest, concession arrangements or other rights to occupy. These will vary according to the jurisdiction and the circumstances of the particular project. The project company may also require additional access rights, easements or written consents in order to carry out construction activities with respect to associated infrastructure for which it is responsible, such as transmission lines. Access to the project site will also be required, not only for the construction, operation and maintenance of the power project, but also to afford the offtaker access to undertake whatever inspection rights it may have under the PPA.

Site Suitability

The project company will typically bear the primary responsibility for the suitability of the project site. Where the project company has had the opportunity to conduct full site surveys, including detailed soil sampling and geotechnical analysis, it may be reasonable for the project company/contractor to take responsibility for geological risk (i.e., whether the site is geotechnically suitable for the construction activity), particularly where the project company has been the primary driver for selection of the project site. Conversely, where the offtaker/host government has effectively preselected the project site and/or the project company has had limited opportunity to conduct such reviews, it may be more appropriate for the offtaker to take such risk. This is particularly the case where the project site is effectively a brownfield site which is being made available to the project company. In such circumstances, the project company is likely

to require appropriate protection, including time relief and deemed completion, as well as robust indemnities for third party claims with respect to any pre-existing environmental contamination.

Where the offtaker/host government has made the land available to the project company, it would also be important for the project company to understand upfront the cost for the lease of the land and the full terms, as this must be factored into the project costs and used to determine the tariff. It is also important to note that, because renewable resources (solar radiation, wind velocity) vary by geography, the government may indirectly increase projects costs by providing land with lower quality renewable resources. In some cases, the government may prefer for the project company to select the land for a renewable energy project since the project company may be able to best determine the matching of the generation technology and the optimum renewable resource.

Site-Related Infrastructure

It is generally the project company which determines and assumes the adequacy of road and rail links (or other transportation links) to and from the project site. This may also extend to the routing or rerouting of existing powerlines and water pipelines required for the supply of utilities to the project site. The availability of the supply of utilities to the project site is also typically the project company's responsibility, although this may vary where the offtaker, host government authority or other related party is operating an adjacent site and enters into an express contractual undertaking to supply such services. Similarly, where it is agreed that a significant piece of infrastructure (such as a transmission line, gas pipeline or road) is to be undertaken by the offtaker or a host government entity, the completion risk associated with such infrastructure may be assumed by the offtaker. Resettlement may also be required in order to acquire the project site. The impact on the timing of the project by a resettlement process should be carefully assessed by the contracting parties to the PPA.

Interconnection Infrastructure

The construction and operation of a new power plant needs to be supported by a whole host of supporting infrastructure. In addition to connection to the physical grid via transmission lines which can vary from a few kilometres to hundreds of kilometres, the construction process also needs to be supported by the availability of utilities and access roads.

In terms of timing, the development of the power plant and associated transmission network should be coordinated to ensure that the power plant is ready to be connected to the grid at the time of commissioning. This also requires planning ahead in terms of availability of fuel and the infrastructure to bring in such fuel.

Transmission Interconnection

The project company and the offtaker shall decide, typically at a very early stage, which party shall be responsible for the construction of the transmission line, as well as the ongoing ownership and maintenance of the line.

Construction by Offtaker

Commercially, the prime incentive for the offtaker to take on the obligation to construct the transmission line is to avoid the higher construction cost if construction is undertaken by the project company. The increased cost of construction by the project company will be passed back to the offtaker through a higher tariff.

The advantage of potential cost savings of construction by the offtaker must be weighed against two disadvantages:

1. The offtaker may not have a source of sufficient funds to undertake the construction, which is a problem facing many utilities in sub-Saharan Africa.
2. If the offtaker commits to constructing the transmission line, then the offtaker will also bear the responsibility if it fails to complete the transmission line when the power plant is ready for commissioning. Under the PPA, this will normally result in the offtaker being required to pay liquidated damages to the power plant, calculated as if electricity is deemed to have been delivered. To reduce the risk of delay in implementing the construction, the offtaker will need to plan ahead in terms of financing and equipment procurement to ensure that completion can be aligned with the timing for completion of the power plant.

Construction by Project Company

Where the project company is responsible for constructing the transmission line, the offtaker will try to control the costs of constructing the transmission line, since these costs will ultimately be passed back to the offtaker via the tariff. The offtaker can try to control these costs by requiring all major supply contracts to be subjected to competitive tendering, and by employing a competent engineer to oversee the implementation of the transmission line construction.

Delivery Point

Once the transmission line has been completed, the PPA identifies the obligation of the project company to deliver energy to a delivery point. The delivery point is a physical location that is specified in the PPA. The project company will want the delivery point as close to the power plant as possible. The offtaker would then take transmission line risk from and

after the delivery point. However, this may be specifically negotiated, particularly where the transmission line will be operated and maintained by a transmission company that is unrelated to the offtaker. This is further discussed in the *Power Generation Markets* chapter, in comparing bundled and unbundled systems.

Testing and Commissioning

Testing and commissioning of the power plant is required before COD in order to ensure that the individual plant and equipment are functioning according to the design and the contracted performance output of the power plant. In addition to the testing of individual equipment, a complete power plant has to be tested to determine the overall output parameters, including, among others, installed capacity, voltage output, frequency and specific fuel consumption. The obligation to carry out tests and commissioning of the power plant rests on the project company, which has to make sure that experts and suitable test equipment are available when required before COD. Sufficient notice must be given to the offtaker and lenders, since they may engage their own experts to witness the tests together with the project company's engineer.

Since part of the testing process for certifying the plant's capacity involves the generation of electricity, the offtaker must be prepared to receive that energy prior to the commencement of the testing and commissioning period. If the interconnector line or the network is not available, then pursuant to the terms of the PPA, the project company may claim liquidated damages for delayed COD, which may include invoking the deemed completion clauses in the PPA. Therefore, there is a need for close coordination of the requirements of either party before and during commissioning of the power plant and related facilities, including the transmission line where applicable. In case the offtaker's facilities are not available when testing and/or commissioning is required, the project company may exercise the right to claim appropriate damages, including

deemed capacity and energy output payments. The offtaker therefore should carefully evaluate its capacity to undertake its obligations to meet the requirements of the testing and commissioning of the power plant.

Renewable Energy COD Testing

In the case of renewable energy projects, the PPA will include the contracted capacity, which is the **MWac** capacity associated with the generation technology that is installed, similar to the installed capacity referred to in thermal energy projects. This is the maximum capacity that the project company could generate at P100, i.e. with 100% probability at a defined level of the renewable energy resource. For the purposes of COD testing, the PPA will reference a lower minimum facility capacity (typically 60-75% of the contracted capacity). To test this minimum facility capacity, the PPA will may require:

A capacity test to establish whether the tested capacity is equal to or greater than the minimum capacity:

- If the capacity test establishes that the actual capacity is equal to or greater than the minimum capacity, the project will usually be certified as having achieved COD by the independent engineer.
- If the tested capacity is equal to or greater than the minimum capacity but less than the contracted capacity, then the project company will face negative financial consequences since the revenue of the project will be reduced due to the lower power output.
- If the tested capacity is less than the minimum capacity, then the project company may be in breach of the PPA and the offtaker may have the right to terminate the agreement.
- In the case of a failure to meet either the minimum or contracted capacity, there will generally be a remedy period for the project company to correct the capacity shortfall.

Failure to Meet Contracted Capacity

Testing and commissioning may reveal lower than contracted outputs and/or failure to meet required performance levels, such as dependable capacity, specific fuel consumption (heat rate), and other issues. Depending on how far the departure of the test results are from the specified output, there may be a need to rectify the plant to meet acceptable performance output, which may result in delays in achieving COD.

If there is no possibility for improving the performance of the power plant, then there are typically two options for the offtaker:

1. To accept the resulting output, with relevant penalties for not achieving the guaranteed output.
2. To reject the project plant and terminate the PPA.

The PPA will contain relevant clauses to address the reduced performance output levels (usually addressed in the capacity charge payment of dispatchable generation plants). In case the test results are not acceptable, then the PPA may have to be terminated or amended substantially, with other remedial actions taken to improve the performance to acceptable levels. The project company bears the risk of performance of the power plant throughout the term of the PPA.

Output/Heat Rate Risk Allocation

Upon testing, if a thermal plant's output and fuel consumption capacity fail to meet the contracted performance levels, the project company may have recourse through its EPC contract to make claims against (a) the EPC contractor and (b) the equipment manufacturer's warranties and guarantees. It is important to note, however, that these protections are not directly available to the offtaker under the terms of the PPA, since the offtaker is not a party to the EPC contract or the equipment supply contracts.

7.3. Operational Phase Risks

Market Risk

The offtake obligations

The offtaker's obligations to purchase the capacity of, and the energy generated by, a power plant (the **offtake obligations**) will be structured somewhat differently depending on the nature of the power project.

With respect to dispatchable power plants (in particular thermal power plants and hydropower projects with sizable reservoirs), the offtake obligation will generally be structured as an obligation (i) to pay for capacity made available (or deemed available) to the offtaker and (ii) to take and pay for energy dispatched by the offtaker and delivered by the project company to the delivery point.

With respect to technologies that are dependent on interruptible renewable energy sources (notably wind and photovoltaic solar projects), the obligation will typically be structured as an obligation to take and pay for all energy actually generated by the power plant or that could have been generated by the power plant in the absence of a curtailment or other grid interruption.

In both cases, the basic principle is that the market risk (the risk of taking and supplying the power to the market, and receiving market payments for the capacity and energy supplied) should be allocated to the offtaker rather than the project company. In a situation where the power plant is available to generate, the offtaker must still make payments regardless of whether the system operator actually dispatches the power plant or "takes" the electricity that could be generated.

These payments are typically referred to as **availability payments** and are structured to ensure that the project company's capital costs (debt service, return of equity and return on equity) and fixed operating costs are covered. Hence, in cases where the power plant is unavailable or incapable of generating electricity as a result of circumstances for which the offtaker (or government) has agreed to take the risk (including, among other things, political force majeure, force majeure affecting the offtaker, change in law, unavailability of the grid, and offtaker default), the project company may be entitled to **deemed availability** or **deemed energy** payments that are also intended to cover capital and fixed operating costs. These contractual devices are crucial to the allocation of risk in a power project.

Curtailment

Notwithstanding the basic principle described above, certain offtakers and/or the relevant transmission system operator may want to reserve some flexibility with respect to the commitment to take interruptible energy through **curtailment rights**. These rights will allow the offtaker not to take a certain amount of available energy without financial consequence.

From the project company's (and the lenders') perspective, they will want certainty that the minimum offtake commitment will cover all fixed costs (including debt service and a minimum equity return). To this end, they may request that the PPA provide for an automatic extension of the term if the curtailment occurs, or they may adjust the PPA tariff from the onset. If the latter approach is chosen, the offtaker should understand that the PPA pricing will assume that the curtailment rights will be fully exercised. Therefore, the offtaker should in turn ensure that if the curtailment rights are not used or are only partially used, an adjustment to the PPA pricing is applied.

Performance

The contracting parties will agree, when entering into the PPA, what the contracted capacity of the power plant will be. In order to reach COD, the power plant must be tested and certified as having met a specified percentage of the contracted capacity. This is generally referred to as a minimum capacity requirement. This testing typically involves participation by the project company, the offtaker and any independent engineer appointed by the parties. For power plants that are paid both a capacity charge and an energy charge, the tested capacity at COD may (depending on how the tariff is structured) determine the capacity charge the offtaker will pay to the project company. This testing is generally repeated on an annual basis, and in each instance the newly tested capacity will impact the capacity charge payable to the project.

If the power plant achieves or exceeds the minimum capacity requirement by the agreed date for scheduled COD, but still does not achieve the contracted capacity, then the project company may have the option of either repairing or replacing the impacted portions of the power plant within an agreed period of time in order to achieve the full contracted capacity. At a certain point in time, the project company may be required to live with the capacity it has been able to demonstrate, and will no longer have the ability to increase the tested capacity up to the contracted capacity by fixing the deficiency and demonstrating the higher capacity of the power plant. In the event that the minimum capacity is not achieved by the agreed outside or long-stop date for COD, the offtaker will typically have the right to terminate the PPA. Some PPAs may restrict the project company from delivering any energy in excess of the tested capacity locked in at COD, or may simply specify that the offtaker is not required to pay for such additional amounts.

In PPAs where the tariff comprises both a capacity charge and an energy charge, because the offtaker is being required to pay for capacity of the plant, it will typically want to ensure that this capacity is available for its use. As such, an offtaker will typically impose minimum availability requirements. Availability is typically measured over an agreed period of time. Minimum availability thresholds are typically negotiated by the parties and are uniquely dependent on project site conditions such as ambient conditions, the particular technical makeup of the power plant and other efficiency criteria provided for in the PPA. The PPA would then provide a remedy to the offtaker for a failure by the project company to meet the minimum availability thresholds. This may take the form of a right to terminate the PPA or the payment of performance liquidated damages by the project company. In any event, under a well-structured tariff, the offtaker should not be required to pay for capacity that is not made available to it.

Dispatch

Under the PPA, the project company is required to strictly comply with the dispatch instructions of the grid operator. The project company takes the risk of any operational failure to dispatch. The grid's dispatch protocol can be referenced by the PPA and becomes part of the PPA, or can be part of the transmission connection agreement to be signed between the project company and the transmission company. Dispatch plans are delivered to the project company to cater for monthly, weekly, and daily load planning purposes.

Special Considerations for Renewable Energy Projects

The allocation of performance risk in renewable energy projects is complicated by the generation profile for these projects, namely the fact that power generation is subject to the intermittent availability of the renewable resource.

7. RISK ALLOCATION AND MITIGATION

In non-dispatchable renewable energy PPAs, the offtaker only pays for the energy that is delivered. The obligation of the offtaker to pay at the tariff rate for delivered energy is sometimes capped at an amount set forth in the PPA, with any excess energy being remunerated at prevailing spot prices if there is a spot market. An offtaker cannot insist upon a minimum delivery obligation on a particular day for non-dispatchable plants because of the project company's inability to control their output which is dependent on weather conditions. To state it plainly, renewable energy projects are in many ways subject to the whims of the sun, the rain and the wind, and are unable to guarantee a particular output on any particular day.

But a minimum availability requirement after COD may be reasonable to ensure that the project generates the expected electrical output, corrected for weather conditions. Availability refers to the plant being able to generate and deliver electricity at its design specification adjusted for degradation; it should not be confused with output. When considering a minimum availability requirement, the project company and its lenders will be concerned to ensure that, if the plant is affected by an unexpected defect that leads to unavailability, there is sufficient time to get the required parts to the site. This can be achieved by having the minimum availability requirement being measured over a reasonable length of time (and a longer period for specific equipment failure where replacement parts identified as not being readily available from equipment suppliers).

PPAs for PV solar projects require the project company to demonstrate that the PV plant (including panels, inverters, transformers, and the balance of plant) has achieved an agreed performance ratio, (particularly at COD prior to issuance of the commissioning certificate) which is a measure of the efficiency of the PV plant in converting solar irradiation into electrical energy. The performance ratio will decline over the term of the PPA as the ability of solar panels to convert solar irradiation into electrical energy degrades. PPAs usually assume that solar panels will

degrade at a constant rate over the term of the PPA. Any deemed energy payment calculations will be affected by panel degradation during the project life.

The project company's obligation to achieve the expected performance ratio at COD is backed by a performance guarantee issued by the manufacturer of the solar panel. The performance guarantee will mirror, or provide for slightly better performance than, the performance ratio requirements specified in the PPA.

Fuel and Other Feedstock Supply

The long-term adequacy of supplies, and the pricing for fuels and other supplies of feedstock are one of the most critical elements in a power project. The allocation of fuel supply risk will depend on a number of issues including, in particular, which party is in the best position to negotiate the supply, the financial viability of the fuel supplier, the availability/accessibility of alternative fuel suppliers, and the state of development of the relevant market for fuel supply.

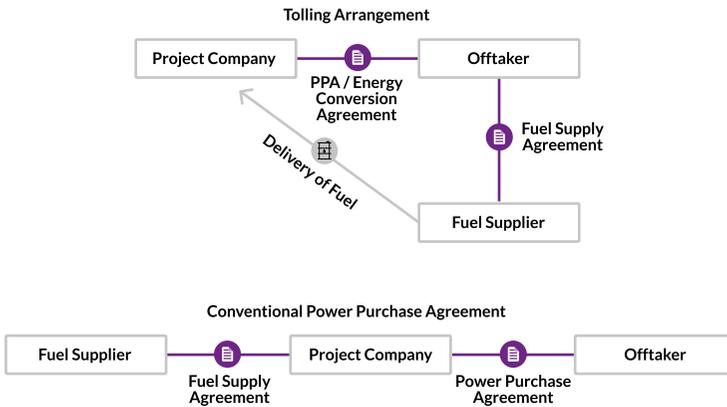
Tolling Arrangements

Project companies are not always in the best position to negotiate and secure a stable supply of a fuel resource such as oil, coal, natural gas, biomass or steam. The offtaker or host government may be better placed to do so. In such circumstances, the offtaker may prefer to structure the power project as a tolling arrangement. This may make sense, particularly where the fuel supplier is owned by the host government or affiliated with the offtaker.

Under a tolling arrangement, the offtaker takes full responsibility for the procurement (including payment) and supply of fuel to the power plant. If the offtaker wishes to dispatch the power plant, it needs to ensure that a sufficient volume of fuel is delivered to the power plant to allow the

7. RISK ALLOCATION AND MITIGATION

electricity it dispatches to be generated. The project company will then take responsibility for ensuring that the fuel delivered to the power plant is utilised in an efficient manner. This is accomplished by requiring the project company to convert fuel into energy at an energy conversion rate that reflects the agreed efficiency of the power plant given the ambient atmospheric and transmission conditions.



Under a tolling arrangement, therefore, the offtaker or the host government will enter into fuel supply agreements directly with third-party fuel suppliers and be responsible for the fuel resource payment. Then the offtaker will enter into a separate agreement, which may be called a PPA, a tolling agreement, or an energy conversion agreement, with the project company. This will contain both the conventional PPA terms and certain terms for the fuel supply. For ease of administration, the project company may give instructions directly to the third-party fuel supplier for the delivery of fuel, and agree to protocols for nominating quantities of fuel to be delivered, and for taking deliveries of that fuel, but the project company should not bear responsibility for payment, nor the risk that the fuel supplier may breach its obligation to deliver the fuel properly nominated by the project company.

Fuel Supply Agreements

Offtakers will often seek to pass greater responsibility onto the project company for procuring fuel supply, however, and require the project company to enter into a fuel supply agreement with a third-party fuel supplier. The project company will then need to contract for sufficient volumes of fuel to meet its contractual commitment to make the power plant “available” under the PPA, so that, if the offtaker elects to dispatch the plant, the project company has sufficient fuel to generate. Conversely, it is important that the project company does not contract for quantities of fuel which it cannot use, or the project company will be making unnecessary payments for excess fuel that cannot be used to generate power.

A detailed analysis of fuel supply agreements is beyond the scope of this handbook, but the project company will need to ensure that a number of key issues are covered, including:

- A binding legal obligation on the part of the fuel supplier to provide the contracted quantity of fuel. This can be contrasted with a “best endeavours” type of obligation, which creates the risk of fuel supply failure with little or no remedies for the project company.
- Appropriate levels of flexibility with respect to monthly and annual contracted quantities to cater for circumstances in which the power plant is not dispatched.
- Appropriate protections with respect to the supply of off-specification (off-spec) fuel. The fuel needs to meet certain specifications. The project company should be entitled to receive liquidated damages from the fuel supplier to cover additional costs incurred as a result of burning off-spec fuel (including the increased use of filters and stoppage time for clean ups and startups).
- To the extent that the project company is assuming responsibility for fuel supply under the terms of the PPA, the project company will also

7. RISK ALLOCATION AND MITIGATION

need to ensure that any liability it incurs under the terms of the PPA for non-availability due to fuel supply failures, are passed through to the fuel supplier. However, it is often difficult or impractical to obtain agreement from a fuel supplier to bear such liabilities.

- Alignment of the commencement of the fuel supply with the commissioning and testing of the power plant under the PPA to ensure the availability of fuel to test the plant before the scheduled COD provided for in the PPA. However, the fuel supply start date should not be too early, or the project company may end up paying capacity payments under the fuel supply agreement well before the fuel is actually needed.

It is important to note, in addition, that liabilities that the project company incurs under a fuel supply agreement in respect of a take-or-pay obligation will, where appropriate, need to be passed through to the offtaker under the PPA. In other words, to the extent that the project company is liable to pay for fuel that is not taken due to a risk assumed by the offtaker under the PPA, the offtaker will need to indemnify the project company for this liability.

As a result, a number of the provisions of the fuel supply agreement will be of direct interest to the offtaker. As explained in Chapter 6.2 *Tariff Structures*, the fuel price will usually be a direct pass-through under the PPA (assuming that the fuel is converted into energy at the agreed efficiency). It is therefore important for the offtaker, as part of project due diligence, to review and ensure that the fuel cost is reasonable and consistent with industry rates. The offtaker should also review the minimum take-or-pay commitment for fuel in the fuel supply contract. Given that the contractual commitment for plant availability is always lower than 100% factoring in periods of maintenance, it is important that the minimum take-or-pay commitment for fuel is not so high as to create a payment obligation for fuel for periods when the fuel is not being utilised due to planned maintenance. In the same vein, the project company should aim to align the scheduled maintenance of the power plant with the

scheduled maintenance of the gas facilities (in the case of a gas-fired power project) as a misalignment may lead to the plant being unable to produce power due to on-going maintenance of the fuel facilities.

It is also important to note that the existence of a separate fuel supply agreement between the project company and the fuel supplier does not necessarily mean that the project company must take full fuel supply risk under the terms of the PPA. The project company's ability to accept fuel supply risk under the PPA will depend largely on its recourse to the fuel supplier and/or its access to readily available alternative sources of fuel. If the fuel supplier is the only or primary viable source of fuel supply, the project company will need to ensure that, on a fuel supply failure, it has recourse to the fuel supplier on a full indemnity basis for any shortfall in revenue, any penalties payable under the terms of the PPA, and ultimately the loss suffered on termination of the PPA. The project company will also need to consider the credit status of the fuel supplier, which could determine its ability to make good on the indemnity if required.

Fuel Transportation Arrangements

These considerations may involve further complexity if there is a division of responsibility for supply and transportation of fuel. Depending on the proximity of the plant to the fuel source, and the nature of the fuel, it may be necessary to enter into a separate agreement with a transporter for transporting the fuel from the fuel processing facility to the plant. This of course would likely increase the risk elements of the project, as the fuel supplier could transfer title and risk of the fuel to the fuel transporter or the project company at a delivery point that is still far from the plant.

Where the fuel supplier commits to delivering the fuel to the delivery point at the power plant, the fuel supplier will bear the risks associated with ensuring that fuel of the right quantity and specification reaches the delivery point at the plant in accordance with the fuel supply contract. Where, however, there is a separate contract for transportation of the fuel, that contract would apportion risks among the fuel supplier, the

transporter, and the project company. The delivery of off-spec fuel to the plant, for instance, may not be the fault of the fuel transporter, but may result from off-spec fuel being provided to the fuel transporter by the fuel supplier, in which case the project company should have recourse to the latter through the remedies provision of the fuel supply agreement. Where the fuel transporter is publicly owned, the project company may make an argument for the offtaker to bear the risk of non-performance or defective performance by the fuel transporter, in addition to fuel transportation force majeure. However, depending on how well-capitalised the public fuel transporter is, it may be able to bear such risks on its own, which also avoids the political challenges of one government entity (the offtaker) bearing the risks of another government entity (the fuel transporter).

Transmission

In a **bundled system**, the market roles of power purchasing, transmission and distribution are all bundled into one entity: the offtaker, usually a state utility. The offtaker, in this context, would bear responsibility for ensuring the transmission of the power that is produced and sold by the project company. Similarly, the offtaker in this system will have the obligation to keep the power plant connected with the power grid.

By contrast, an **unbundled system** is one in which one or more of these roles is not the responsibility of the offtaker, and is handled by a different entity. The extent of this separation is dependent on the specific electricity reform path adopted in a particular jurisdiction.

There are unique transmission risks in an unbundled system. The core concern in an unbundled system is the creditworthiness of the transmission company and whether it can afford to cover the risk of failing to transmit when the power is: (a) ready for delivery; and (b) required under the PPA. From the offtaker's perspective, transmission risk is outside their control, and therefore not a risk they wish to bear. From the

7.3. OPERATIONAL PHASE RISKS

project company's perspective, they likewise will have limited control over transmission risk and will argue that it should be borne by the party with more leverage in the transaction: the offtaker. This is particularly true in situations in which the offtaker and the transmission company have an established relationship (i.e., both are government-owned parties or part of the same holding company). The project company will argue that the government as a whole is benefiting from the delivery of power and should therefore bear the risk that one of its entities does not connect the power plant or transmit the power when needed. As a result, PPAs in an unbundled power market will often allocate most or all of the transmission risk to the offtaker so that the offtaker acts as a guarantor of the transmission company's obligations. It should be noted however, that this carries a moral hazard risk due to the fact that the transmission company may be negligent in discharging its obligations under the transmission contract, confident in the fact that any financial consequences will be borne by another government agency. Appropriate back-to-back provisions should therefore be put in place between the offtaker and the transmission company to permit reimbursement of the offtaker.

7.4. Foreign Exchange

Power projects can be financed in local currency or in a reserve currency. The local currency is the currency of the jurisdiction in which the project is to be constructed and operated. A reserve currency is a currency that is widely held in significant quantities by governments and central banks as part of their foreign exchange reserves and is commonly used as a medium of international payments. Reserve currencies, such as U.S. dollars and Euros, are commonly used to finance power and infrastructure transactions. They are also referred to as hard currencies. As a general rule, reserve currencies benefit from relatively low inflation levels, particularly when compared to emerging market currencies.

For additional information on risks related to the convertibility of currencies and foreign exchange rates and their impact on the financing of power projects, see the handbook *Understanding Power Project Financing*, at sections 3.4 (*Particular Aspects of Project Finance*) and 7.4 (*Political Risk Insurance*).

Reserve Currency Financing as the Status Quo

In emerging markets, including in sub-Saharan Africa, power projects are typically entirely, or mostly, financed in a reserve currency. It is often not possible, due to liquidity constraints and market availability, to finance long-term debt in local currency in the magnitude required by many grid-scale power projects.

In an emerging market, the project company and the lenders that are lending in a reserve currency typically insist that the tariff be denominated in, or indexed to, the reserve currency in which the loans are denominated, in order to address their concern that the local currency will likely depreciate against the reserve currency over the long term.

In addition, the payment obligations of a project company under other project agreements, such as the fuel supply agreement, operations and maintenance agreement, long term service agreement may be denominated in a reserve currency. Fuel supply agreements, for example, are traditionally denominated in US dollars. Project companies that are exposed to these types of payment obligations denominated in reserve currencies must ensure that the revenues they receive under the PPA are sufficient to cover those obligations and do not expose the project to significant foreign exchange risks.

The Currency Mismatch Challenge

While debt service and payment obligations are usually denominated in a reserve currency, an offtaker almost always charges its consumer in local currency. The result is a currency mismatch – the offtaker pays for power in a reserve currency but earns its revenues in the local currency. This mismatch is significant and strains the overall risk profile of a power investment in the following ways:

- First, particularly during periods of volatility in foreign exchange rates, it reduces an offtaker's ability to meet its payment obligations to a project company under a reserve currency-denominated tariff.
- Second, if currency depreciation strains an offtaker's ability to pay the project company, resulting in payment defaults, it can result in the project company lacking funds to repay its reserve currency-denominated debt.

Examples of Foreign Currency Adjustment Mechanisms

In the South African Renewable Energy IPP Procurement Programme, the PPA is local currency denominated (Rand). The only escalation allowed during the term of the PPA is indexation, at CPI. However, the projects in this programme do have foreign currency spend (equipment supply, a

portion of financing, construction costs, etc.). The procuring entity therefore included a limited foreign currency adjustment mechanism in the procurement stage of the programme. The bid-in tariff is allowed to be adjusted for the changes in capital expenditure which is foreign currency-denominated. The adjustment can be made from bid submission to financial close, as long as the bidder's IRR is unchanged. This adjustment occurs at financial close, and after financial close no further adjustments are allowed. There was also a cap imposed on the portion of the capital expenditure allowed to be adjusted (e.g., the adjustment is capped to [x] % of the capital expenditure). In each bid round, the assumptions and cap may change depending on the level of local content participation required on the projects (see *Other PPA Provisions* chapters for further discussion on local content).

Convertibility and Transferability Considerations

Where payments under a PPA are in local currency (linked to a reserve currency), the exchange rate prevailing at the time the payment is made will determine the amount the offtaker must pay in local currency.

Nevertheless, the offtaker and host government should carefully consider the impact of currency conversion on the ultimate price of the purchased electricity. Even if the offtaker is allowed to make payments in local currency, the PPA will typically provide for periodic adjustments of the PPA pricing if the project company incurs any loss in the process of converting the local currency payment into reserve currency. The conversion risk remains on the offtaker and the project company may not have the incentive or ability to minimise the loss incurred through the conversion process. Due to the size of payments for grid-scale power projects, it is important to hold extensive discussions with the central bank to assess the limitations of the local currency market and ensure that the conversion-related costs will not ultimately significantly increase the PPA tariff. An invoicing/conversion protocol can be established to minimise the loss or even, a decision that the offtaker host government is better placed to convert the payments could ultimately be taken.

Discussions with the central bank should also be held to assess any potential obstacles to the transfer of funds from local accounts to offshore accounts. The risk of not being allowed to transfer the funds outside of the country (transferability risk) will impact the bankability of the project and if it materialises during the operations phase of the project, may trigger the termination of the PPA.

Political Insurance

Payments in local currency also carry the risk that the local currency may become inconvertible during the term of the PPA. It is possible to mitigate this risk by purchasing political risk insurance that specifically covers the risk of currency inconvertibility. Such coverage is available from a limited number of DFIs. This type of coverage does not, however, cover losses caused by changes to foreign exchange rates.

Hybrid Reserve/Local Currency Financing

While financing power investment exclusively in local currency may not be possible, it may be possible to develop a hybrid solution by financing part of a power project in local currency and the remainder in the reserve currency. The primary advantage of having a portion of a power project financing denominated in local currency is to avoid or minimise currency mismatch and the associated risks, at least for that portion of the project's debt service requirements. Another key benefit is that local currency financing is more likely to attract local sources of financing, thereby strengthening local lending markets.

Hedging Instruments

Hedging is used by the project company to protect it against movements in foreign exchange rates. While hedging instruments can be highly complex, in a project finance context they are usually kept relatively simple. Typically, the financial institutions providing the hedging instruments are themselves senior lenders to the project company. Hedging can be an

7. RISK ALLOCATION AND MITIGATION

effective strategy over the short term – to hedge during the construction period in the event that the project loans and the purchase price payable to the EPC contractor are denominated in different currencies, for example. However, long term foreign exchange hedges are usually either prohibitively expensive, or unavailable.

7.5. Other Risks

Compliance with Law and Change in Law

The offtaker and the government will likely require the project company to contractually commit in the PPA to comply in all material respects with the laws of the relevant country. The project company should in turn be able to commit to do so, at least by reference to applicable laws at the outset of the project on the basis of legal due diligence and advice. The project company (and by extension its lenders) will, however, find it difficult to give an unqualified commitment to comply with laws to the extent that laws may change over time.

The concept of **Change in Law** has evolved to include (a) the introduction of new law, (b) modification of existing law and/or (c) changes in the interpretation of law by any court, tribunal, governmental entity or other authority which has applicable jurisdiction or regulatory oversight with respect to the project or the project company. “Law” in this context should be defined to cover a comprehensive range of legislative, statutory and regulatory instruments, orders, guidelines, and so on.

Timing

There may be some debate between the offtaker and the project company as to the date from which any change in law should be considered. This will often be the date of signature of the PPA. However, where the project company has committed to a tariff in the course of a tender process, it may be more appropriate to set the date at the date of submission of the project company’s proposal (in response to the RFP). This is an issue that can sometimes be resolved by due diligence to determine whether a change in

7. RISK ALLOCATION AND MITIGATION

law has occurred that might have an impact on the project company's cost structure. However, depending on the transparency of legislation in the jurisdiction, and the time available to the project company to perform such due diligence, it may make more sense for the offtaker to add this incremental risk to the risk of changes in law after execution of the PPA, which it will often already have agreed to take.

A change in law may impact the project company in a number of ways:

1. It may adversely affect performance of a particular obligation under the PPA or render performance impossible.
2. It may adversely affect the project company's revenue stream.
3. It may require the project company to incur a one-off capital cost or cause an on-going increase in the project company's operating costs (in each case, in order for the project company to comply with the relevant change in law).
4. Conversely, it may lead to a reduction in the project company's operating or forecast capital expenditure.

Subject to appropriate materiality thresholds, the project company and offtaker will generally agree that the project company should be left in no better or worse position than if the relevant change in law had not occurred. Thus, to the extent the project company is temporarily unable to perform an obligation as a result of a change in law, this will not constitute a project company default and any time limits imposed on the project company will be extended accordingly. Furthermore, if the change in law causes a delay in COD, the plant may be "deemed complete" and to the extent that the plant is unavailable as a result of such change in law, the project company may be entitled to deemed availability or deemed generated energy payments. In addition, if the project company incurs an increase in costs or decrease in revenues as a result of a change in law, this will entitle the project company to receive either (a) direct compensation to pay for or reimburse the project company for such cost or revenue shortfall, or (b) an appropriate tariff increase. Conversely, if the project

company benefits from a change in law, then an appropriate downward adjustment in the tariff will typically apply. If a change in law renders performance under the PPA impossible, the project company will generally be entitled to terminate the PPA with the level of compensation applicable assessed in the same way as termination for political force majeure.

Consents, Permits and Licences, Lapse of Consent

Project Company's Responsibility to Secure Consents, Permits and Licences

Offtakers understandably want power plants to be built and operated in accordance with the consents required by applicable law.

The project company is typically responsible for obtaining the necessary consents to build, own and operate the power plant. These include, amongst others: a construction permit, an environmental licence, an archaeological permit, and an operating permit. The term **consents** is generally understood to include any registration, declaration, filing, consent, licence, right, approval, authorisation, or permit.

Offtaker's Obligation to Assist in Securing Consents, Permits and Licences

It is not the case that all obligations regarding consents reside with the project company. Because the offtaker is often affiliated with the host government, it is anticipated that the offtaker will have some connections to, and influence over, other government agencies. In addition, as an established entity in the domestic market, the offtaker is often more familiar with the legal and regulatory requirements for operations in the market. As a result, the parties will typically agree that the offtaker should

be obligated to offer “reasonable assistance” to the project company in obtaining consents. Ultimately, this is in the interest of all of the parties, including the lenders, who will need the assurance that the project company has obtained all of the necessary consents.

Joint Coordination for High-Level Approvals

In certain instances, the parties may agree that the responsibility to obtain particular consents from higher levels of government is a joint responsibility. Such approvals might include consents of the relevant authorities (such as cabinets, parliaments, ministries of finance, ministries of energy, tax authorities, regulators, and central banks). Since such consents are often necessary for the effectiveness of a PPA, it generally makes sense that both parties would work together to ensure that they are obtained on time.

Rights to Land

The obligation to obtain rights to the land on which the power plant, and the relevant transmission lines, will be located, will vary from transaction to transaction and jurisdiction to jurisdiction. In jurisdictions where the government owns all of the land or large areas of land where the power plant is intended to be located, the offtaker will often be expected to grant, or cause another government entity to grant, the necessary land rights to the project company. In other jurisdictions, however, it is incumbent upon the project company to secure access to, and the right to use, the land. In such instances the offtaker may still be called upon to assist the project company in obtaining such rights, especially where private land owners are unwilling to sell their land and the government can use its right of expropriation or eminent domain (the right of a sovereign or its agencies to acquire private property for public use in exchange for fair compensation).

The nature of land rights also varies from jurisdiction to jurisdiction. Where the land system does not provide freehold title, the term of use (or lease) of the land must be sufficient to cover the life of the project.

Lapse of Consent

Where a government authority fails to grant or renew a consent upon due application of the project company, who has satisfied all relevant requirements for the issuance of the consent, this will be treated in the same way as a change in law. This is sometimes referred to as a **lapse of consent**. Note that where the project company is unable to complete the requisite formalities to obtain or renew a consent as a result of a change in law, the change in law protection should nonetheless apply. It bears noting that the concept of lapse of consent is sometimes referred to in PPAs as a political force majeure event, with the same net effect.

Change in Tax

Changes in tax law or regulation may severely impact project revenue and could result in making a project fundamentally uneconomical. The change may come in the form of a change in tax rate, the creation of a new class of tax, or removal of relevant tax benefits that may adversely affect the project's return on investment and/or its ability to service its debt. The consequences of a change in tax may:

1. Increase or decrease project costs.
2. Increase or decrease the maintenance and operation costs.
3. Increase or decrease the revenues expected by the project company.

Material issues to consider in relation to the management of change in tax risks includes the following:

Reference Date by Which Change in Tax is Measured

A change in the tax position must be defined relative to the tax position at a reference date. The reference date is commonly agreed between the

parties and could be the date of the signing of the PPA or the date of financial close.

Whether the Change is Discriminatory in Nature

In determining which party shall bear the risk of change in tax, distinction is normally drawn between three categories of changes:

1. Changes that are applicable specifically to the project and the involved sponsors, contractors and lenders only (**discriminatory change in tax**);
2. Changes that are applicable to the industry in general or similar class of investors (**specific change in tax**); or
3. Changes that do not fall into the above two categories and are applicable to the general community (**non-discriminatory change in tax**).

For a discriminatory change in tax, the offtaker is normally expected to bear this risk by means of tariff pass through. In other words, any increased tax charges are included in the tariff calculation of project costs, and therefore the offtaker has to pay a tariff that is reflective of the extra tax charges. For a non-discriminatory change in tax, the project company is normally expected to accept this as part of the risk of conducting business in the host country. In relation to a specific change in tax that is not discriminatory in nature, this is often open to negotiation between the parties.

Mitigating the Risk of a Change in Tax

Mitigation measures against changes in tax are normally implemented through one or more of the following:

- Host government undertaking and political risk insurance: An undertaking by competent host government authority(ies) that no change in tax, imposition of new tax, or removal of tax benefits shall be

applicable to the project company, its sponsors and contractors throughout the life of the project. The project company can further mitigate this risk by obtaining political risk insurance to insure against breach of the undertaking by the host government.

- **Tariff pass through:** The tariff is designed to allow full pass through of any increase in tax, imposition of new class of tax, or removal of tax benefits during the term of the project that are “discriminatory” or “specific” in nature.

Change in Control

Just as important as assessing the viability of a project being developed by the project company in determining whether to finance a project, both the lenders and the offtaker also undertake an assessment of the project company itself, and the parties in control of the project company. The reputation of these parties, and their experience and track record, all influence the offtaker and lenders in assessing whether the project company will have the ability to meet its obligations under the PPA. It therefore becomes important to both the offtaker and the lenders that the project company’s shareholders be restricted from unilaterally changing the control of the project company.

PPAs normally contain explicit provisions on the meaning of control and what constitutes a change in control of the project company. The PPA could provide that a change in control of the project company cannot occur without offtaker consent. Typically, the PPA will state that the offtaker cannot unreasonably withhold its consent. Alternatively, a change in control may only be allowed after a prescribed time period (this may be aimed at, for example, locking in the parties for the initial loan term, or for the construction phase). Further conditions may be imposed that if a change in control has to occur, then it cannot reduce the local ownership requirement of the project company, or that the new entities must have

the same reputational standing as its predecessor. The latter may be quite a subjective assessment. The restrictions and conditions will vary from project to project.

The project company may also have an interest in changes in control of the offtaker, particularly in those jurisdictions undergoing an unbundling of the electricity supply industry and the restructuring of a monopoly utility offtaker. Where sovereign support has been provided for the offtaker's obligations under the PPA, this issue may be less important to the project company. However, where no such support has been provided, and the investment grading, reputation, and sophistication of the offtaker were key considerations for the project company and the lenders when concluding the PPA, then the offtaker may be similarly restricted from undergoing a change in control without the project company's consent. There may also be conditions imposed on the offtaker that, for example, the restructured offtaker have the same investment grading as its predecessor, or an obligation that sovereign support be provided.

Political Sovereign Risk and Expropriation

A PPA is a commercial agreement for the supply and purchase of electricity between a private developer and an entity frequently owned by the host government. There is a risk that the host government may decide to interfere in the functioning of the plant, directly or indirectly, with the result that the project company is no longer able to generate project revenues. In turn, this will jeopardise the project company's ability to service its debt, as well as shareholders' return on equity. Such interference is typically provided for, either under local political force majeure, or under a separate provision dealing with host government risk events.

The consequences of expropriation should be addressed in the PPA. Expropriation may be in relation to the physical plant or shares in the

7.5. OTHER RISKS

project company, and the PPA should cover both instances. In the former case, the government could deploy security personnel to physically take over the plant, and in the latter case the government could compulsorily take over ownership of shares in the plant. There is need for clear definition of actions that come within this umbrella, including nationalisation, confiscation, requisition and other related actions.

It may also be necessary to make provisions for creeping expropriation, which usually refers to situations where the government does not directly expropriate a plant but takes measures that ultimately ensure that the project company is no longer in effective control of the plant, including onerous regulatory impositions and restrictions in foreign currency purchase or repatriation where the PPA tariff is denominated in local currency. Such measures may be covered in provisions dealing with local political force majeure or change of law or tax which, unless compensated for by the offtaker, could spell doom for the project.

It is also important for the PPA to provide for what is not expropriation. Otherwise, the government may find itself facing severe penalties for taking legitimate actions that are not generally recognised as amounting to expropriation. Governments are usually able to take measures for regulating economic activity in the country, including health and environmental safety measures, and tax-related measures. However, such measures must be made in good faith and not be discriminatory in nature or primarily intended to confiscate private property. Also, where a project company has contractual agreements with government-owned companies responsible for associated infrastructure, such as transmission and gas transportation, it is also important to distinguish between expropriation, which is essentially a political act, and commercial disputes, which should be dealt with in accordance with the remedies provided for in these agreements.

Project companies typically argue that expropriation should be treated as a termination event under the PPA, for which the project company should be fully compensated for the expected revenue stream over the life of the

7. RISK ALLOCATION AND MITIGATION

PPA. The precise calculation of the termination payment is discussed in Chapter 8 *Post-Termination Obligations*. In any case, compensation under PPA termination may or may not be appropriate, depending upon the extent to which the offtaker is independent from the host government. The more independent the offtaker is, the better the argument that the project company and the lenders should cover the risk of expropriation in some other way, rather than expect the offtaker to pay them in full in such event.

In addition, all parties should consider whether the offtaker will have a source of funds with which to make any termination payments in the event of expropriation. If not, this obligation should be supported by a sovereign guarantee.

Where there is a separate agreement dealing with the compensation regime, such as a PCOA, it should clearly provide for exactly what the payout should be in the event of expropriation, to avoid any ambiguity.

A project company may also consider getting political risk insurance from an institution such as the Multilateral Investment Guarantee Agency (MIGA), which is part of the World Bank Group. The benefit of MIGA insurance is not just the certainty of a payout in the event of expropriation, but more importantly, it significantly reduces the likelihood of expropriation due to the reputational risk for the government and the likely adverse collateral impact on its perception in other international transactions.

7.6. Force Majeure

It is important to have a clear provision dealing with force majeure in a PPA, which will set out the meaning and consequences of force majeure. It may also specifically describe what is not covered within the scope of force majeure in the PPA.

Key Features of Force Majeure

In general, force majeure tends to have the following defining features:

- The event has a material adverse impact on a party's ability to discharge contractual obligations.
- The event is not the fault of the party seeking relief and is beyond the reasonable control of the party.
- The event could not have been reasonably foreseen by the party, and reasonable measures could not have been implemented by a diligent party to avoid it nor mitigate its impact.

Sometimes, the definition extends beyond the event itself to the continuing impact of the event. For instance, when there is a major unexpected flood that damages a power plant, and it takes up to a month for the flood water to be drained out before the commencement of damage assessment, the force majeure relief claimed could go beyond the day of initial flooding and also extend to the continuing impact of the flooding.

It is also important to clarify what is not covered within the scope of force majeure. Where a power plant is down because of poor maintenance, it does not fall within the scope of force majeure. This would also be the case where the project company has failed to contract for sufficient quantity of fuel to enable it to produce the full contract capacity. Both of these events are reasonably foreseeable and could have been avoided through

reasonable measures (i.e., proper maintenance or sufficient fuel supply contracts). Similarly, unavailability of funds may not be claimed as force majeure by the offtaker.

Types of Force Majeure

Force majeure under a PPA could be placed in a number of categories, the key ones being local political force majeure, foreign political force majeure and natural force majeure.

Local political force majeure tends to cover events that are either caused by the government of the host country or could be best prevented, controlled or mitigated by the government. Events in this category would include widespread riots and civil disorder, acts of terrorism, and nationwide industrial strikes. The scope could also extend to lack of transmission grid availability to evacuate the power from a power plant where it is owned by the government, as well as unavailability of any other associated infrastructure needed by the power plant which is publicly owned or controlled. Some element of change in law could also fall within the scope of local political force majeure, such as the host government's introduction of restrictions on offshore payments which prevent scheduled payments to offshore equity and debt providers.

Foreign political force majeure tends to cover acts of a political nature that are of foreign origin but still have a material adverse impact on a party's ability to continue with PPA obligations. For instance, an industrial strike in a foreign country could mean that a critical piece of plant equipment, such as a replacement turbine, manufactured in that country, cannot be exported to the country where the power plant is located. A trade embargo could also have a similar impact.

Natural force majeure covers events such as flooding, hurricanes, earthquakes, tsunamis and other adverse weather or natural conditions

that have a material adverse impact on a party's ability to meet its contractual obligations.

Example: Kenya has had recent experience with force majeure claims due to riots, land issues, incidents with Somali pirates and the terrorist group Al Shabaab. These have led Kenyan authorities to attempt to scale back and redefine local and external force majeure events in their PPAs and related agreements. In particular, in response to land and riot issues, Kenya is seeking to limit the government's liability for political force majeure to incidents they have directly caused or indirectly caused through their action or inaction. Kenya is also seeking to exclude piracy as a force majeure event and limit compensation in respect of terrorism to only what is not covered by insurance. It is important to note that Kenya's attempt to reduce force majeure protection is being met with resistance in the market and it is not yet clear what the impact will be of this shift of risk to project companies in terms of project cost and access to financing.

Extension of Force Majeure

Typically, a PPA will provide for force majeure relief to extend beyond the PPA to other project agreements that the PPA parties are also party to, including fuel supply and transportation agreements, EPC contracts and transmission agreements. As such, where the occurrence of a force majeure event prevents the fuel supplier or transporter from supplying fuel to the power plant, the project company may be able to seek relief from its contractual obligation under the PPA for minimum plant availability. Given the fact that a PPA counterparty may wish to seek force majeure relief for events that occur under other agreements, it is important to aim to have a harmonised concept of force majeure across all the project agreements. Otherwise, there is a risk that an event that is defined as a force majeure in the transmission agreement, for instance, may not feature

as a force majeure event under the PPA. Consequently, due to such misalignment, that event may not qualify a party for relief from its other contractual obligations.

Relief from Contractual Obligations as a Result of Force Majeure

As has been discussed, a party claiming force majeure usually wants relief from contractual obligations during the duration of the force majeure event. If the force majeure period is protracted, the PPA would usually identify how long relief from contract obligations will be granted before the unaffected party can seek contractual termination.

In a PPA, it is often important to draw a distinction between force majeure affecting the offtaker and the project company respectively. Where the offtaker is affected by force majeure, the PPA would usually provide for continuation of capacity and energy payments to the project company during the period of the force majeure. If the effect of the force majeure event affecting the offtaker is to delay the COD date, the project company may be entitled to claim a **deemed completion**. In that instance, the project company may be entitled to **deemed capacity payments** that cover debt service (which would have commenced on the original COD date) and any additional project costs incurred as a result of the delay. A project company will also expect financial relief as well as time relief in case it is affected by local political force majeure.

7.7. Insurance

From the planning to the construction and operation phase of the project, there are a multitude of risks that are best mitigated by means of insurance.

Construction Phase

During the construction phase, the EPC contractor shall be primarily responsible for obtaining insurance against property damage and injuries to personnel. Types of coverage include:

- All Risks (Property Damage) insurance: usually covers the replacement cost of the project plant;
- Employers Liability insurance: usually covers the liability of the employer for disease, fatality or injury to employees arising out of workplace conditions or practices; and
- All Risks Marine Cargo insurance: usually covers the replacement cost of plant and equipment shipped to and intended to become part of the power plant.

Commercial Operation Phase

Upon commencement of commercial operation of the plant, the project company typically bears the responsibility of obtaining and maintaining all risks (property damage) insurance and employer liability insurance.

In addition, the project company may also want to obtain political risk insurance against the host government renegeing on its undertaking or guarantee in respect of the following (if any):

- Free convertibility of currency and sufficiency of foreign reserve.

7. RISK ALLOCATION AND MITIGATION

- No change in law or tax, or on a cancellation of tax benefits that may adversely affect the project.
- Cancellation of permits or concessions; and/or expropriation.

In all cases, the exact insurance cover required for a particular power project will be determined on a case-by-case basis in consultation with a specialist insurance adviser. Lenders will typically require the appointment of an insurance adviser to advise them on the adequacy of the insurance program for the power project.

7.8. Summary of Key Points

Risk Management

Allocation of risk: The risks inherent in the PPA should be allocated to parties best equipped to mitigate that risk.

1. **Seller risk:** The seller will typically bear the risks associated with their construction and operation obligations under the PPA. This may include the risk of failure to commence construction, failure to reach the contract Commercial Operations Date or the failure of the constructed plant to satisfy the capacity requirement.
2. **Exception to seller risk:** The seller may be excused from a failure to meet its obligations when the delay is a result of the offtaker's action (or inaction). In this case, the seller may be granted additional time or compensation for any additional costs incurred in resolving the delay.
3. **Offtaker risk:** The risk of lower-than-expected demand in the power market is typically allocated to the offtaker through the use of capacity payments, in the case of dispatchable projects, or by undertaking to buy all electricity the plant generates and delivers, in the case of non-dispatchable renewable energy projects. The offtaker may also take on fuel supply risks through the use of tolling agreements.

General Risks

1. **Force majeure:** The seller or offtaker may be released from obligations under the PPA due to the occurrence of events that are beyond their control and which they could not reasonably have foreseen. In addition to the release of obligations, the sellers may also be entitled to receive capacity payments if certain force majeure events occur.
2. **Stabilisation clauses:** Changes in tax and in laws may pose risks for sellers because they can fundamentally alter the economics of the original agreement. The PPA will typically include terms that allow the seller to be made economically whole in the event of a material change.
3. **Change in control:** PPAs may seek to restrict the ability of sellers to change their controlling shareholders since offtakers may have offered to enter into the PPA on account of the financial strength of the majority shareholder in the project company. Lenders may have similar concerns about shareholders and offtakers.

Foreign Exchange

1. **Convertibility risk:** if payments under the PPA are in local currency, and the debt for the project is a foreign currency, the power producer is subject to the risk of being unable to convert the local currency to satisfy the foreign currency debt payments. There are a number of different approaches to address this exposure in the PPA.

8. Default and Termination

8.1. Introduction

Parties entering into a contract such as a PPA usually do so with the intention that it is long-term contractual relationship which will endure for its full term. The termination of a PPA is a dramatic event and is almost never in the interest of any of the parties. Ideally, a PPA should be structured to encourage the parties to maintain and sustain the contractual relationship.

This chapter first seeks to provide guidance on the circumstances and events which may lead to the non-defaulting party exercising its right to terminate the PPA. The list of default events in this chapter is not exhaustive, and always has to be considered against the individual PPA concluded between the parties and the legislative and policy framework of the jurisdiction in which the power plant is located.

The chapter moves on to explain events which occur as a result of no fault of either party, known as "non-default events". These events can also give the parties the right to exercise an option to terminate the PPA (for example a prolonged force majeure event).

This is followed by an analysis of the consequences of a termination and the remedies available to the non-defaulting party. Particular attention is paid to the calculation of termination payments, whether directly under the PPA or under a PCOA or a similar arrangement.

8.2. Types of Defaults

Offtaker Event of Default

Typical types of offtaker events of default are set out below. It is important to note that the cure periods here are merely illustrative to understand the timing of such events. The actual cure periods under a PPA are typically negotiated and will depend upon the nature of the market, the structure of the project, and the generation technology.

8. DEFAULT AND TERMINATION

Failure to pay	Failure to pay any amount due to the project company within a prescribed cure period after receipt of notice that such payment is overdue.
Insolvency	Bankruptcy and insolvency events, which include appointment of liquidator, administrator, trustee, custodian or similar in a proceeding brought against the offtaker, or appointment and failure to discharge the appointment within [90]* days in proceedings brought against the offtaker.
Misrepresentation	Misrepresentation that has a material adverse effect on the project company's ability to perform its PPA obligations if the misrepresentation (if curable) is not cured within [30-60]* days of notice.
Failure to meet offtaker construction milestones	Failure of the offtaker to achieve interconnection construction milestones for reasons not attributable to force majeure, nor to the default of the project company (related to offtaker interconnection infrastructure and assets and any other associated facilities that the offtaker is required to construct), following a cure period that is reasonable, given the complexity of the associated facilities that the offtaker is required to construct, and the potential impact of delays on the critical path timeline for the construction of the power plant.
Default under another key project agreement	The occurrence of an offtaker event of default or host government event of default under another key project agreement.
Change in law	The occurrence of a change in law that, in each case for a period of [90 to 180]* days, renders a material undertaking of the offtaker void or unenforceable, renders a material right of the project company void or unenforceable, and/or restricts repatriation of dividends or the payment of loans, which effect is not mitigated by credit-enhancing undertakings by the host government to cover for such events.
Assignment	Assignment of the PPA (including by reorganisation or privatisation of the offtaker) in violation of any provisions of the PPA that prohibits the assignment of the PPA.
Material breach	Any other material breach by the offtaker following notice and failure to cure within 30 days of notice (or to commence curing within 30 days about fail to cure within 90-180 days.

* This number is merely illustrative. The number under the PPA will be negotiated by the parties.

Project Company Event of Default

Typical project company events of default which may lead to the right by the offtaker to terminate the PPA are set out below. The cure periods are merely illustrative and usually negotiated between the contracting parties. The applicability of these events to a particular project depends in large part on the project structure.

8. DEFAULT AND TERMINATION

Failure to reach financial close	Failure to achieve financial closing within [90]* days of required financial closing date for reasons not attributable to the offtaker's default.
Insolvency	Insolvency events (appointment of liquidator, administrator, trustee, custodian or similar in a proceeding brought against the project company or appointment and failure to discharge the appointment within [90]* days in proceedings brought against the project company).
Misrepresentation	Misrepresentation that has a material adverse effect on the offtaker's ability to perform if the misrepresentation (if capable of being cured) is not cured within [30-60]* days of notice.
Failure to commence construction	Failure to issue the notice to proceed to the EPC contractor within [10-15]* days of financial closing.
Failure to achieve COD	Failure to achieve COD within [180]* days of the scheduled COD for reasons not attributable to force majeure or the default of the offtaker, or failure to reach COD by the long stop COD.
Abandonment	Abandonment of the project for [30]* days or more.
Insurance	Breach of the project company's obligation to maintain insurance (following notice, and other than as a result of the non-availability of such insurance on commercially reasonable terms).

8.2. TYPES OF DEFAULTS

Consents	Failure to maintain government consents (other than as a result of a failure of the government to issue those consents following the submission by the project company of the application for the consent together with the supporting materials that are required by applicable law to be submitted with the application, and the payment of the applicable fees required by applicable law).
Failure to operate according to prudent operating practice	Persistent failure to operate in accordance with prudent operating practice or prudent utility practices.
Availability thresholds	For dispatchable power plants, the failure to achieve minimum levels of availability, sometimes combined with a failure to propose and implement a remedial plan that is designed to return the levels of availability to the minimum levels of availability within an agreed period of time.
Assignment	Assignment of the PPA in violation of any provisions of the PPA that prohibit the assignment of the PPA.
Change in control	Change in control of the project company without consent.
Material breach	Any other material breach by the project company following notice and failure to cure within [30] days of notice (or commence curing within 30 days and cure within [90 – 180]* days).

8.3. Notice, Cure Periods and Lender Rights

Notice and Cure Periods

The PPA itself contains certain cure periods for defaults by the project company. These are the amounts of time the project company has to cure a particular default before the offtaker can exercise remedies. Lenders may request longer cure periods than those agreed between the project company and the offtaker. Lenders also want direct notice of these defaults. If the lenders do not exercise their right to cure during this additional cure period, then the offtaker can exercise its remedies under the PPA.

Typically, offtakers are willing to agree to these provisions at the request of lenders, to some extent. If lenders are willing to cure defaults, this can benefit the offtaker. However, offtakers are concerned that lengthening cure periods will make it more difficult for them to exercise their remedies. The specific length of the additional cure periods is negotiated.

Lender Rights

Lenders are concerned that the project company may fail to comply with its obligations under the PPA, since this can result in the offtaker having the right to terminate the PPA and, ultimately, jeopardise the ability of the project company to repay the lenders. Therefore, in a typical project, lenders will require notice of any default, certain minimum cure periods, and step-in rights to cure defaults directly. These matters will often be dealt with by way of direct agreements.

Lenders may request equivalent provisions, such as notices, cure periods, and step-in rights, for other key project documents, but the concern is most significant for the PPA, since the PPA is the revenue-producing contract.

Step-in Rights

For more significant events of default by the project company, it may be necessary for the lenders to **step-in** to be able to no longer have the obligations of the project company after curing the breach.

As with notice and cure periods, offtakers are generally willing to agree to step-in rights for the lenders, but they may not want the length of the step-in period to be as long as the lenders would typically want. The lenders' argument is that the decision to step in and assume the rights and obligations of the project company requires deliberation, particularly if the lending group is relatively large, and requires a vote to direct the lenders' agent to step in. On the other side, the offtaker does not want long delays in its ability to exercise remedies against a project company that is breaching its obligations under the PPA.

Novation/Substitution

In addition to lenders curing a breach either during the PPA cure period or stepping in during the step-in period under the direct agreement, a third scenario may arise where the project company gives notice that it is no longer capable of operating the project. The simplest solution for all parties is to identify a new owner of the project company (who will put in place a new management team if required) and exercise the lender's share security in the project company to transfer the shares to the new owner. In this case, all contracts and assets will remain with the existing project company.

However, in some cases, the project company may have incurred an unquantifiable liability which the new owner does not wish to take on. In

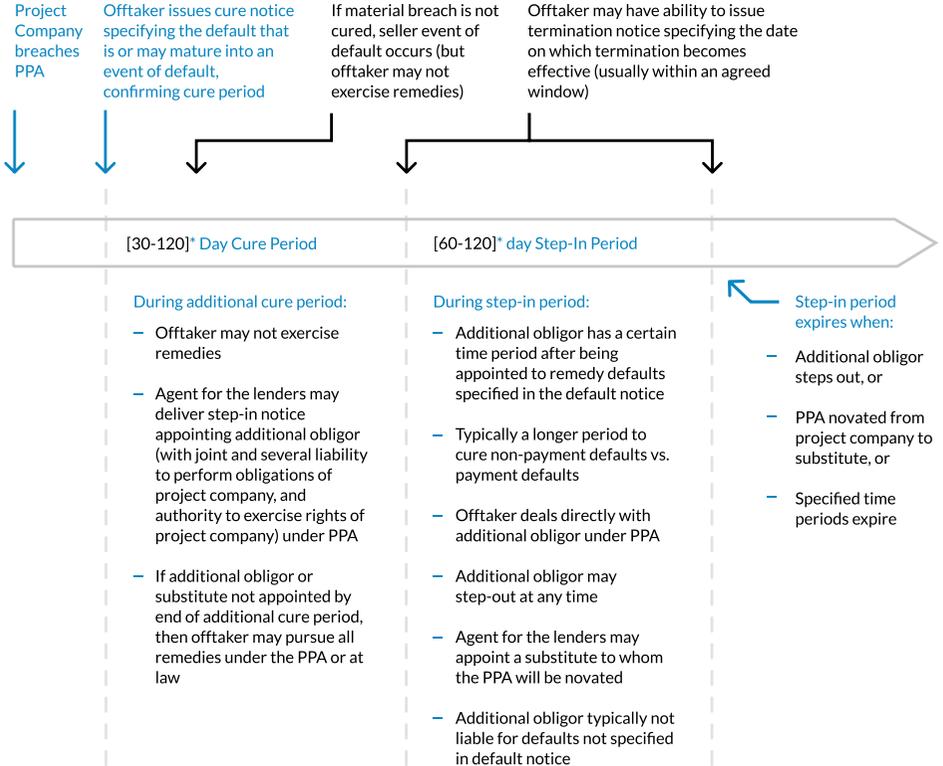
8. DEFAULT AND TERMINATION

that case, the new owner will establish a new SPV and the assets of the project (including all contractual rights) will be transferred to this entity, which effectively takes over the original project company's role and the project company is removed from the project.

The PPA (and other key project documents) will need to provide for such a transfer in the first instance or be renegotiated before the lenders can successfully transfer the project to the substitute entity. This transfer is generally referred to as a **novation** of the PPA. The offtaker (and other key contract counterparties) may reserve the right to approve the substitute entity, although lenders will be concerned that such approvals could delay the process.

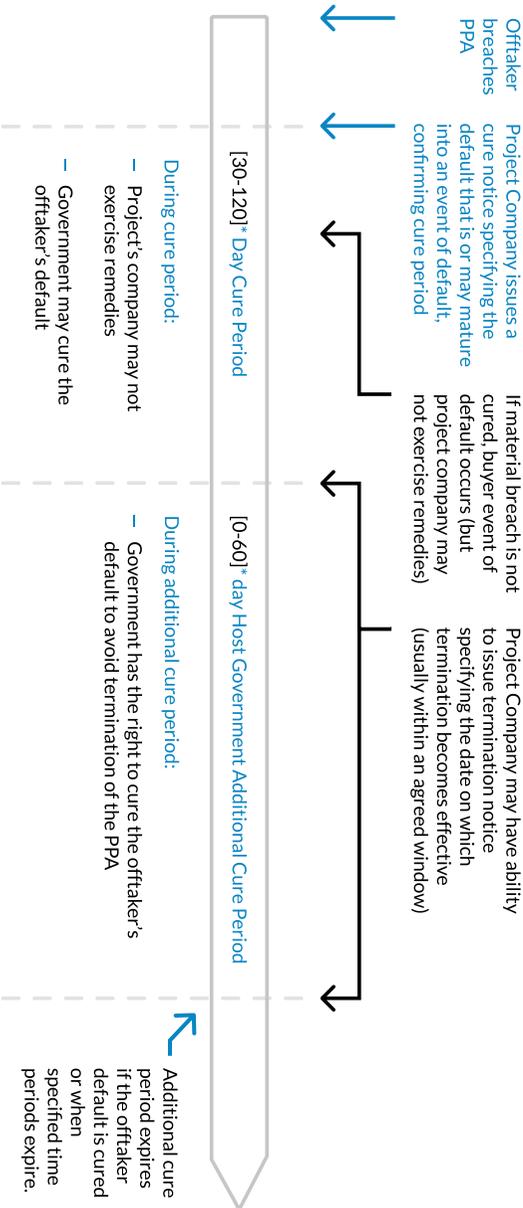
Defaults Flowcharts

Seller Default Flowchart



* The number of days is indicative and should be negotiated between the parties

Buyer Default Flowchart



* The number of days is indicative and should be negotiated between the parties

8.4. Non-default Events

If through no fault of either party, performance of the PPA is rendered impossible, the offtaker or the project company will usually have the right to terminate the PPA. This situation mainly occurs due to force majeure events, both political and non-political, which persist for a prolonged period of time, and make impossible the performance of obligations by one or more parties under the PPA.

Offtaker may terminate following	Project company may terminate following
Prolonged natural force majeure events	Prolonged natural force majeure events
Prolonged foreign political force majeure events	Prolonged foreign political force majeure events
Prolonged local political force majeure events if:	Prolonged local political force majeure events if:
1. Local political force majeure events render continued performance or restoration unlawful or impractical.	1. Local political force majeure events render continued performance or restoration unlawful or impractical and offtaker elects not to continue paying capacity payments.
2. Prolonged fuel constraints following use of reasonable efforts to arrange alternative supply (depends on technology).	

8.5. Post-Termination Obligations

In an emerging market context, where markets are not fully unbundled and no wholesale or retail competition exists, there is usually only a single buyer for power. That single buyer is the offtaker. If the PPA is terminated, then the project company will no longer be able to generate revenue because it no longer has a buyer for its power. Although in such a scenario the project company could, in theory, dismantle the power project and sell it to a purchaser in another country, in practice it is generally technically impractical or uneconomic to do so. Even if resale of the project assets is possible, the developer will never achieve its expected investment had the project operated under the full term of the PPA.

In order to mitigate this risk, investors and lenders require that an offtaker or host government agree, in the PPA or in a separate agreement (such as a sovereign guarantee, government support agreement, or put and call option agreement), to purchase the power plant together with all of the associated facilities (or all of the outstanding shares in the project company) and compensate the loss of long-term return on capital in the event that the PPA is terminated.

The obligation to purchase a project following the termination of a PPA may be framed as termination compensation (which is also referred to as a termination payment) or framed in economic terms such as a put option and a call option.

Following the explanations of post-termination obligations, this chapter will demystify the various calculations necessary to determine the termination payment amount.

Termination compensation

Termination compensation is a pre-agreed amount of compensation an offtaker or host government will pay to the project company in exchange for the purchase of all of the assets of the project company.

In the case of a PCOA, the post-termination obligations will be framed in terms of put options and call options.

A **put option** is typically stated as the combination of:

- An option held by the project company to require the offtaker or the host government to purchase the assets of the project company.
- An option held by the shareholders of the project company to require the offtaker or the host government to purchase all outstanding shares in the project company, at a price calculated pursuant to a pre-agreed formula.

A **call option** is typically stated as the combination of:

- An option held by the offtaker or the host government to purchase the assets of the project company.
- An option held by the offtaker or the host government to purchase all outstanding shares issued by the project company, at a price calculated pursuant to a pre-agreed formula.

Even though it is not as explicit, post-termination obligations framed in terms of a termination payment, whether captured in an implementation agreement, a sovereign guarantee or other government support agreements, will typically produce similar results to the put and call structure. As such, the offtaker and host government might not have an explicit right to buy the power plant under a sovereign guarantee, but the offtaker's right to terminate the PPA will effectively force the transfer of the power plant by the project company. Hence, the offtaker will have the right to 'call' (buy) the power plant by virtue of its termination right under

the PPA, even if that option is not explicitly stated in a PCOA. Furthermore, sovereign guarantees are typically issued in support of offtakers that are state-owned companies, which renders immaterial whether the 'buying' right sits with the offtaker or at the host government level.

The sections below examine whether an offtaker will be required to purchase, or a project company or its shareholders will be required to sell, the project or the outstanding shares in the project company resulting from the termination of a PPA, following certain events. The 'trigger' event will also determine the purchase price, which may vary from one ground of termination to another.

Offtaker Events of Default

It is generally accepted that the project company and the shareholders will have the right to sell the power plant (or shares) if the PPA is terminated following an offtaker event of default.

Project Company Events of Default

The offtaker typically has the right and obligation to buy the plant following the termination of the PPA by the offtaker. However, in situations where the offtaker terminates the PPA following the occurrence of a project company default related to construction risks, the offtaker might not be obliged to purchase the plant.

Note that even if the offtaker has the obligation to buy the power plant upon termination of the PPA for a project company default, the offtaker needs to take affirmative steps to terminate the PPA. Hence, the obligation to buy the plant remains subject to the PPA termination by the offtaker.

Expropriation

The expropriation of all or a material part of the assets of the project company, or the shares in the project company, will usually trigger an offtaker event of default. In these circumstances, the consideration for

termination compensation rights will include: (a) any assets (or shares) that have not been expropriated; (b) the release by the lenders of their security over the assets and the shares in the project company; and (c) the release by the project company (or the shareholders) of any claims they may have against the offtaker or the host government that arise out of the expropriation.

The purchase price payable in this scenario should be reduced by any compensation already received by the project company or the shareholders as compensation for the assets (or shares) that were expropriated.

Prolonged Political Force Majeure Event Affecting the Project Company

Generally, the right to sell or purchase will become exercisable if either party terminates the PPA as a result of a prolonged political force majeure event. Note, however, that a prolonged political force majeure event may not create a right on the part of the project company to terminate the PPA if the offtaker continues to pay capacity payments (in the case of a thermal plant) or deemed energy payments (in the case of an intermittent renewable) during a prolonged political force majeure event.

The offtaker may argue that it should have the right to purchase the power plant following the termination of the PPA following a prolonged political force majeure event, since the offtaker (as opposed to the host government) is unlikely to be able to prevent political force majeure events. Alternatively, it may also advance the position that since the host government might not be able to prevent all events which constitute political force majeure events, the offtaker should have the right to purchase the plant following the termination of the PPA following a prolonged political force majeure event that is beyond the control of the host government.

Prolonged Political Force Majeure Events Affecting the Offtaker

Other than any undertakings to build associated facilities or infrastructure, the offtaker's primary obligations are those of payment, which are not

relieved by force majeure events. As a result, the occurrence of a prolonged political force majeure event is unlikely after any such associated facilities or infrastructure have been constructed.

As is the case with prolonged political force majeure events affecting the project company, the offtaker may argue that it should have the right to purchase the plant if the PPA is terminated following a prolonged political force majeure event affecting its ability to perform under the PPA, since the offtaker (as opposed to the host government) is unlikely to be able to prevent political force majeure events.

Prolonged Natural Force Majeure Event Affecting the Project Company

The project company will have the right to sell the plant to the offtaker if the PPA is terminated following a prolonged natural force majeure event affecting the project company.

The offtaker may argue that the right to sell the plant should not be exercisable because the project company is required by the PPA to insure its assets and, to the extent that its insurance does not cover a natural force majeure event, this risk should be borne by the project company. It is unlikely to be accepted by the lenders if the natural force majeure risk is not fully or mostly insurable.

The right of the offtaker to purchase the plant is customarily exercisable if the PPA is terminated by either party because of a prolonged natural force majeure event affecting the project company.

Prolonged Natural Force Majeure Event Affecting the Offtaker

The right to sell the plant to the offtaker is customarily exercisable if the PPA is terminated by either party because of a prolonged natural force majeure event affecting the offtaker.

The same argument applies to both a prolonged natural or political force majeure event affecting the offtaker. The offtaker may argue that it should

have the right to purchase the plant if the PPA is terminated following a prolonged natural force majeure event affecting its ability to perform under the PPA since it is unlikely to be able to prevent natural force majeure events.

Purchase Prices

The purchase prices should vary depending on the trigger event. In order to provide the proper incentives to all parties, it is appropriate to divide the trigger events into the following three categories:

- **Buyer Default/Offtaker Attributable:** Trigger events that are attributable to the offtaker or the host country result in the payment of the highest purchase price, which is sometimes referred to as Offtaker Default Purchase Price.
- **Seller Default/Producer Attributable:** Trigger events that are attributable to the project company or the sponsors result in the payment of the lowest purchase price, sometimes referred to as the Project Company Default Purchase Price.
- **No Attribution:** Trigger events that are attributable to neither party result in the payment of a purchase price that is between the offtaker default purchase price and the project company default purchase price. This mid-point purchase price is sometimes referred to as the Natural Force Majeure Purchase Price.

Although a wide variety of methods can be used to calculate the purchase prices, some fundamental building blocks are commonly used. These building blocks are shown in the two sample methodologies for calculating purchase prices in the illustrations below. In these illustrations, the variables shown in black constitute a common core of variables that appear in all of the purchase prices. Variables that appear in blue may or may not appear in the formula depending on the purchase price. Variables that appear in red are alternative methods for calculating one of the variables. It should be stressed that these are simply examples as to how purchase prices can be calculated.

The illustration shows the typical trigger events and the purchase price that would typically be payable following the sale or purchase of the plant (or shares).

Examples of Purchase Price Calculations

The illustration that appears below shows an example of how purchase prices can be calculated.

Pre-COD Project Company Default Purchase Price = DO + TC - IP - EP - ER - DM - USC

Post-COD Project Company Default Purchase Price = DO + TC - IP - EP - ER - DM

Offtaker Default Purchase Price = DO + TC - IP - EP - ER - DM + SCO + PTRSCO

Natural Force Majeure Purchase Price = DO + TC - IP - EP - ER - DM + SCO

Variable	Meaning
DO	Debt outstanding* plus hedge break costs
TC	Termination costs (taxes arising out of transfer, cost to terminate other project agreements)
IP	Insurance proceeds
EP	Expropriation proceeds (<i>proceeds from remedies for expropriation under applicable law</i>)
ER	Environmental remediation (<i>the cost of bringing the facility into the condition required under the PPA</i>)
DM	Deferred maintenance remediation (<i>the cost of bringing the plant to the condition in which the PPA requires the Project Company to maintain it, as determined by an independent engineer</i>)
USC	Un-contributed equity commitments that should already have been contributed
SCO	Shareholder contributions outstanding (<i>assuming equity is redeemed on a straight-line basis</i>)
PTRSCO	Post termination return on shareholder contributions outstanding (<i>a return of X% on outstanding equity for an agreed fixed period</i>)

8.5. POST-TERMINATION OBLIGATIONS

**Negotiated:* Offtaker will want outstanding principal specified in a schedule, with the debt outstanding capped at the amount set in the schedule plus any debt that may be outstanding as a result of the relevant termination event. Lenders will want all outstanding debt to be included.

The illustration that appears below shows another example of how purchase prices can be calculated.

Pre-COD Project Company Default Purchase Price = DO + TC - IP - EP - ER - DM - USC

Post-COD Project Company Default Purchase Price = DO + TC - IP - EP - ER - DM

Offtaker Default Purchase Price = DO + TC - IP - EP - ER - DM + SCO + DFD

Natural Force Majeure Purchase Price = DO + TC - IP - EP - ER - DM + SCO

Variable	Meaning
DO	Debt outstanding* plus hedge break costs
TC	Termination costs (taxes arising out of transfer, cost to terminate other project agreements)
IP	Insurance proceeds
EP	Expropriation proceeds (<i>proceeds from remedies for expropriation under applicable law</i>)
ER	Environmental remediation (<i>the cost of bringing the facility into the condition required under the PPA</i>)
DM	Deferred maintenance remediation (<i>the cost of bringing the plant to the condition in which the PPA requires the Project Company to maintain it, as determined by an independent engineer</i>)
USC	Un-contributed equity commitments that should already have been contributed
SCO	Shareholder contributions outstanding (<i>assuming equity is redeemed on a straight-line basis</i>)
DFD	Discounted future distributions (<i>future dividends and redemption payments for the full term of the PPA, discounted to NPV at equity IRR</i>)

8. DEFAULT AND TERMINATION

**Negotiated:* Offtaker will want outstanding principal specified in a schedule, with DO capped at the amount set forth in the schedule plus any debt outstanding that may be outstanding as a result of the relevant termination event. Lenders will want all outstanding debt to be included.

8.6. Summary of Key Points

Events of Default

- **Offtaker Events of Default:** Events of default attributable to the offtaker's obligations, such as the failure to pay or failure to achieve offtaker's construction milestones, will be categorised as Offtaker Events of Default. This category may also include events outside the offtaker's control, such as a change in law.
- **Project Company Events of Default:** Events of default attributable to the project company's obligations, such as failure to complete construction or failure to operate the plant properly, will be categorized as Project Company Events of Default. Unlike Offtaker Events of Default, this category is strictly limited to events entirely within the control of the project company.
- **Non-Default Events:** Events outside the control of either party may render the PPA impossible to complete. This category typically includes force majeure events but may also be negotiated to include other events, such as prolonged fuel constraints.

Notice, Cure Periods and Lender Rights

- **Notice and Cure Periods:** Defaults and force majeure events may trigger a right to terminate but this will remain subject to notice and time periods to allow the default to be cured or the effects of the force majeure event to be mitigated.

- **Step-In Rights:** Lenders will require the right to step in and cure breaches by the project company in order to avoid the termination of the PPA.
- **Novation/Substitution:** If the lenders are unable to cure a breach by the project company by exercising their step-in rights, then the lenders may novate the contract to an entirely new project company to resume operation of the project and avoid termination of the PPA.

Post-Termination Obligations

- **Purchase Price:** The purchase price will depend on the type of event that triggers termination (Offtaker, Seller, Non-Default). There are a number of different methods for calculating the price.

9. Other PPA Provisions

9.1. Introduction

This chapter deals briefly with some important matters that are typically dealt with in the PPA but that do not necessarily fit neatly into the other chapters of this handbook. For instance: How will the parties resolve any disputes that arise under the PPA? What happens when the PPA comes to the end of its term? How might local content or ownership provisions impact the cost of a PPA? How are matters of confidentiality dealt with? Finally, what basic contractual provisions must be in the contract that are relatively non-negotiable, or that only the lawyers lose sleep over? This chapter sets out to answer these questions and more.

9.2. Resolving Disputes

Goals of Resolving Disputes

Disputes happen. Even after reading this guide and negotiating a sound PPA with all of the proper advisors in place, and despite best intentions, things do go wrong and circumstances will change. After all, a PPA is a long-term contract and parties cannot always anticipate with certainty what will materialise over a period which sometimes can extend to 30 years!

When a dispute does occur, it is in the interests of all parties to resolve these disputes as quickly, efficiently and amicably as possible. The purpose of dispute resolution mechanisms are to ensure that whatever type of dispute arises, it gets resolved quickly so the parties can revert to performing their respective obligations under the PPA. When a dispute is prolonged, it is to the detriment of all parties and the project.

Disputes arise for a variety of reasons. These disputes can relate to a range of issues, including technical or financial issues, for example, an invoicing dispute, a dispute in the way the power is metered, or an interpretation of an industry term. Disputes can also relate to an interpretation of the contract, especially around areas relating to the manner or timing of each party's obligations.

Informal Resolution Mechanisms

The best thing parties can do when a dispute arises, is to talk to each other. An ongoing dialogue between the parties after the execution of the PPA

can help to quickly resolve most disputes. If the technical staff are not able to resolve an issue, it might help to include a discussion between senior management of both the offtaker and the project company.

The PPA typically imposes an obligation on the parties to attempt to amicably resolve issues through dialogue before going to formal dispute processes. PPAs normally require that parties negotiate in good faith before undergoing any type of formal dispute mechanism. Without demonstrating that the parties tried to amicably resolve the dispute, other more formal mechanisms may not be available. This may be necessary to force the parties to talk to each other.

Formal Resolution Mechanisms

When informal mechanisms fail to resolve the issue, the PPA will provide for various formal resolution mechanisms.

Fast Track Dispute Resolution

Other alternative forms of fast track dispute resolution mechanisms can be considered by the contracting parties. These will often include provisions for immediate decisions rendered for certain types of “simpler” disputes, usually related to technical or invoicing issues.

The types of disputes that can be covered by a fast track dispute resolution mechanism will typically be pre-defined. The parties can also choose whether or not the fast track decisions will be binding.

Role of the Independent Engineer

For technical issues such as the achievement of COD, metering, measurement or capacity issues, the dispute can be submitted to an independent engineer. The independent engineer can give an opinion that

can help resolve the dispute. There could also be particular identified issues where the determination of the independent engineer shall be binding on the parties.

The list of issues that can be submitted to an independent engineer can be agreed upon during the negotiation stage and included in the PPA. The mandate of the independent engineer is usually recorded in a separate agreement between the independent engineer and the PPA contracting parties. The parties can agree to pre-appoint an independent engineer when entering into the PPA, or to decide later. However, given that the independent engineer will be used to resolve a dispute which assumes that the parties are in disagreement, prior appointment of an independent engineer or shortlist is advisable.

Mediation

There can also be provisions for non-binding mediation. This process utilises a neutral party to facilitate a discussion between the offtaker and project company. The outcome of this can be a recommendation which can help resolve the dispute quickly.

Arbitration

Arbitration is the process used in PPAs to resolve the disputes that cannot be resolved through informal or fast track resolution mechanisms. Unless the PPA includes provisions requiring the parties to use arbitration, the dispute would be submitted to the courts that have jurisdiction over the parties and issues.

There are various options for pre-established procedural rules for arbitration including the World Bank's International Centre for Settlement of Investment Disputes (**ICSID**), the International Chamber of Commerce (**ICC**), the United Nations Commission on International Trade Law (**UNCITRAL**), or the London Court of International Arbitration (**LCIA**).

Limitations on ICSID Arbitration: When selecting a dispute resolution mechanism, PPA drafters should bear in mind that a number of multilateral and government-owned DFIs will not accept ICSID arbitration as a dispute resolution option in the PPA because they lack **standing**, i.e. ICSID rules do not permit those lenders to submit claims before arbitral tribunal. This lack of standing prejudices their ability to enforce step-in or security rights in respect of the PPA, which generally limits those DFIs from lending to the project altogether.

Each of these procedural rules include provisions for issues such as the qualifications of the arbitrators, the number of arbitrators, the method of appointing arbitrators, the confidentiality of the proceedings, the powers of the arbitrator, fees and costs of the arbitrators, and the force of the awards. One advantage of arbitration proceedings is that the parties to the dispute maintain some flexibility to structure the proceedings in the most adequate manner for the issue at hand.

The Seat of Arbitration

The PPA should outline the *seat* where any dispute resolution proceedings will take place. The seat sounds like it is where the arbitration will physically take place, but it is important that the seat not be confused with the venue of the arbitration. The seat is important because the law of the seat will (either favourably or unfavourably) fill in gaps not catered for by the arbitral rules, impact on the role of the courts with regard to the independence of the arbitrators, and might even override certain arbitration rules.

The law of the seat can even influence the ultimate enforceability of any award. Prudent contracting parties would undertake a comprehensive due diligence of the chosen seat.

Host countries often seek to have their own countries be chosen as the seat, while international investors usually prefer a seat related to their home countries or other common jurisdictions for international finance. Many of the lenders will require that the seat of arbitration be somewhere outside of the host country to ensure that the process is perceived as neutral.

Choice of Law

The interpretation of the PPA may vary significantly depending on which country's laws govern the interpretation of the PPA.

Optimally, the same governing law would be chosen for all the project documents so that disputes under related agreements can all be heard in the same proceeding. But this is an ideal scenario, and often does not materialise practically in view of the matrix of project documentation in a power project.

Enforceability of Arbitral Award

Parties often prefer arbitration to litigation due to the enforceability of an arbitral award. An arbitral award may be enforced in a country which is a signatory to the New York Convention (Convention on the Recognition and Enforcement of Foreign Arbitral Awards).

Outside the Contracts: the Role of Investment Treaties

It is important to note that many host countries are signatories to various investment treaties. Investment treaties are agreements between states in which each state party promises to provide certain types of treatment to

9. OTHER PPA PROVISIONS

investors from the other state party. States commit to treat foreign companies “fairly and equitably” and are required to provide **full protection and security** to investments.

It is important to note that compliance with domestic law is not a defence to a breach of an investment treaty. Even if the government’s action is entirely consistent with its own law, it may still be inconsistent with the investment treaty. It is important for investors and host countries to understand what treaties may apply in the resolution of any dispute.

9.3. Local Content and Ownership

Several countries have developed laws and policies requiring local content or ownership. These obligations may be set out in project-level documents, sector-specific policies, or national procurement laws, and can sometimes even appear as regulatory or licence requirements in licences issued by regulatory authorities. The general aim of these laws and policies are (a) to ensure that in addition to funding and building critical power infrastructure, foreign investment directly benefits domestic market participants, and (b) to gradually build the capabilities and capacities of local providers of good and services. Such local content provisions may also be used to ensure that a percentage of the costs of a project are denominated in local currency, thereby reducing foreign exchange risk.

Local content can take many forms. Local manufacturing, labour, services, materials and equipment, technology transfer, insurance and banking services, and skills development for nationals are a few examples of local content requirements. Similar to such content provisions, host governments may also require a degree of local ownership of a project company.

Local content and ownership provisions are generally not included in PPAs, and are more likely to be found in the RfP or the concession or implementation agreement between the project company and the host government. Nonetheless, failure to abide by such local content or ownership provisions can have very real implications under the PPA, including potentially leading to default and termination. Local content and ownership provisions are not always mandatory and may instead be a statement of intent or a voluntary act that is rewarded with economic incentives.

While the general economic benefit of increasing local content or local ownership may be clear to policy makers, it is important to understand that these policies also result in increased costs at the project level. This is because local content and ownership provisions limit equipment supply options and economy-of-scale benefits, and may have an impact on equity investment and debt financing sources, all of which will likely be captured through higher tariffs under the PPA.

Practice Note: Potential Limits to Local Ownership

Local ownership requirements differ considerably from local content provisions since they require bringing on long-term local partners rather than procuring the short-term delivery of local goods or hiring of local labor. In many emerging markets where power demand is the greatest, local partners with the technical and financial capability to participate in a project are often limited in number. This has the effect of capping the amount of foreign investment that can flow into a market since there are limited pools of local investment to match those flows. In order to overcome this limitation, foreign investors may be required both to invest their own participation in the project and to fund local partners' participation. This higher investment leads to increased equity costs that are ultimately reflected in a higher tariff under the PPA. Moreover, where local ownership is required as part of a license, foreign investors take the risk that their local investor might seek to sell down their ownership stake, which may result in a loss of the license or default under the PPA. Local ownership requirements may also have the unintended effect of concentrating wealth and ownership of critical infrastructure, which runs counter to the broad-based economic development imperatives that local content and ownership policies are meant to produce.

In particular, with regard to equipment and materials, local content provisions can limit project companies to local suppliers who may only offer products at a higher cost and/or lower quality, which results in increased capital and operations and maintenance costs. The inability to

use a foreign product with an established track record of performance, in favour of a local product that may not have the same proven longevity or performance, may deter certain investors altogether because they will face increased purchase, operations, maintenance, and training costs for their personnel. If not deterred, such investors will seek to recoup such costs through a higher tariff under the PPA.

In addition, local content provisions can result in fewer debt funding sources being available for a project. For example, due to treaty, legal or policy reasons, some lenders are prohibited from providing financing where material local content requirements exist, particularly certain government-owned DFIs and ECAs. This can limit a project company to higher-cost sources of funding, which, at a minimum, will result in higher finance costs or may make a project altogether unbankable.

As a result of the danger of cost or market distortions from local content and ownership policies, those responsible for crafting such provisions should ensure that the provisions are clearly articulated and structured so that their scope and cost can be accurately determined by all parties. Lack of clarity on either of these points can dissuade qualified (and potentially lower cost) providers from participating in the ownership, financing and development of a project.

Where it is determined that a local content or ownership provision is desirable, host governments may be able to limit the cost impacts of such provisions by limiting their size and scope relative to the overall project, making compliance voluntary, and/or allowing exemptions where options for local content are very limited. The following example helps illustrate this strategic approach:

South Africa's Economic Development Requirements under the REIPPP

South Africa's Renewable Energy Independent Power Procurement Programme (REIPPP) is a large-scale competitive procurement program for renewable energy that successfully conducted four rounds of project tenders between 2011 and 2018. The bid evaluation criteria for REIPPP included a number of economic development (ED) factors, including the sourcing of local goods, hiring of local labour, co-ownership/investment by local partners, and engagement with local communities. While a full evaluation of the scope and methodology of the ED system under the REIPPP is complex, there are two general observations on the ED's treatment of local manufacturing content that help illustrate the strategic approach outlined in this chapter:

- The REIPPP set minimum ED thresholds that project developers had to satisfy in order for their overall bid to be considered, while also setting ED targets that would, if achieved, result in a bid achieving a higher score. For example, in Round 1 of the REIPPP, developers of solar PV projects had to surpass a threshold of at least 35% locally procured project content, however they were awarded extra scoring points if they exceeded a target of 50%.
- As the REIPPP progressed from one round to the next, the local content threshold and targets for solar PV projects placed an even greater target on bidders. In Round 2, the target increased from 50% to 60% and in rounds 3 and 4 both the threshold and targets increased to 45% and 65%, respectively.

9.4. Expiration of the PPA

At the expiry of the term of the PPA, including any extensions that may be applicable, the power plant may either be transferred to the host government, sold to a third party, continued to be owned by the original developer, or decommissioned.

Transfer or Continued Ownership

At the expiry of the term of the PPA, depending on the structure of the deal, the plant may be transferred to the host government. In some cases, the project company may also have the ability to sell the plant to a third party. The PPA should deal with the parties rights at the expiry of the PPA. In any case, during the negotiation phase of the PPA, the possibility that the plant may retain a residual value at the end of the PPA term should be recognised.

Where the project company retains ownership of the plant at the end of the term, and does not transfer it to the offtaker or host government, the project company may choose to enter into a new PPA or otherwise operate the power plant and sell power on a spot basis (i.e. not under long-term contract).

Decommissioning

In some cases where the power plant may have no more use for generation, the project company may have the contractual obligation to decommission the plant in a manner that complies with the legal and environmental requirements. This varies, based on the legal and regulatory framework and the type of technology.

9. OTHER PPA PROVISIONS

The decommissioning obligations would include dismantling and removal of the power plant equipment from the project site, and a site cleanup and restoration to the satisfaction of the government and in accordance with the environmental management plan. The cleanup activity may include land refill if required for the subsequent use of the land. The environmental obligations may last for several years after the expiry of the PPA.

9.5. Confidentiality

Most PPAs include a confidentiality provision that requires both parties to maintain the confidentiality of sensitive commercial or technical information. There may be exceptions for disclosures that are required by law, courts, or regulatory authorities.

Confidentiality provisions may be complicated by policy concerns around the general power market. The government and offtaker may wish to keep confidential any financial incentives or other measures that were provided to attract initial project investments. The government may also be concerned that the more generous terms offered for certain projects may prejudice its ability to negotiate lower tariffs for future projects. This desire for confidentiality must be balanced with transparency and public accountability concerns. The need to engage and build trust with the public is especially important given that consumers will eventually bear the costs of the power project.

9.6. Boilerplate Provisions

In addition to the obligations that reside within a PPA, it is worth noting (if only briefly) the existence of the little-loved boilerplate provisions. These lonely back-of-the-document provisions occupy the more remote corners of most PPAs and have the impressive ability to make even the most scrutinising reader's eyes glaze over after even the most cursory review of their headings. Suffice to say, boilerplate provisions do exist for various reasons, including to ensure the enforceability of the bargain struck by the offtaker and the project company in the meatier and more interesting portions of the PPA. Boilerplate provisions are rarely controversial, but are a necessary component of the PPA.

This section highlights some of the boilerplate provisions you may see at the back of a PPA.

Limitation of Liability and Indemnification

The PPA will normally contain provisions limiting the liability of each party to the other party. Such provisions will usually exclude liability by either party to the other for remote or unforeseeable losses (i.e., consequential loss or loss of profits). As a general principle, the compensation or damages payable under the PPA by either the seller or the buyer should be contractually agreed and clearly defined amounts (i.e., liquidated damages).

There is also a related provision dealing with indemnification and sole relief. The former may provide that each party will indemnify the other party for losses suffered or payments made as a result of the negligent, willful or reckless acts or omissions of the other party. The latter may state that the sole relief available to the parties are contained in the PPA.

Sometimes, a minimum annual threshold is agreed beyond which indemnification will be made. This is generally aimed at avoiding the administrative inconvenience involved in constantly seeking indemnity for small amounts.

Indemnification for third-party death or injury is normally unlimited.

Governing Law

The PPA will provide for the governing law applicable to the PPA. Provisions of general law which may apply automatically or might otherwise allow a party to apply to a court for an amendment to the contract (such as financial hardship clauses) should, to the extent legally possible, be excluded. This is to ensure that the substance of the commercial transaction, as agreed by the parties in a mutually negotiated contract (in other words, the PPA), is not unduly eroded.

Amendment of the PPA

The PPA, like most agreements, will typically include a provision dealing with amendments to the PPA. Sometimes, following the execution of the PPA, as the project company steps up efforts to raise financing for the construction of the plant, different prospective lenders scrutinising the PPA and other project documents may request that certain provisions be amended, due to their perception of how various risks could imperil the revenue stream of the project needed to pay off the project loans.

Usually, amendments need to be agreed in writing by both parties to the PPA. Depending on the particular jurisdiction, there may be a requirement for regulatory and/or parliamentary approval for the amendment before it becomes effective.

9.6. Summary of Key Points

- **Dispute resolution:** there are a number of mechanisms established to prevent termination of contracts. These include mediation and arbitration which seek to settle disputes outside the judicial court system. Under certain circumstances the parties may still have recourse to the courts.
- **Expiration of the PPA:** when the term of the power purchase agreement expires, the parties can agree to either transfer the plant, sell the plant, or decommission the plant. Alternatively the project company may retain and continue to operate the power plant.
- **Local content and ownership:** host governments may be inclined to put in place laws or policies to ensure that, in addition to the funding of a power plant, foreign investment directly benefits certain participants in domestic markets. Such provisions should be carefully crafted to avoid limiting equity funding and financing sources and increasing tariff costs.
- **Confidentiality:** special obligations may be established under the PPA to address confidentiality of privileged information.
- **Boilerplate:** the PPA will typically include a significant number of back-of-the-document (aka boilerplate) provisions including limitation of liability, indemnification, governing law and others.

10. Other Types of PPAs

10.1. Introduction

In the majority of power project finance transactions, the parties to a PPA will be a private project company and a utility offtaker in a single country intending to enter into a long term arrangement. With the constant evolution of project finance, the concepts of limited recourse financing have been extended to other types of transactions which may or may not include the traditional parties. The next few sections highlight PPAs for emergency plants, captive power plants and cross border transactions. For each we discuss some interesting features and point out some issues for further consideration.

10.2. Captive Power

A captive power plant is a facility that is dedicated to providing a localised source of power to an energy consumer, generally a large scale industrial facility. Captive power plants tend to supply power to businesses that would otherwise rely on the grid for their power supply. In this instance, the offtaker, called a host, is the business which benefits from the captive power source.

In the context of energy-deficient economies, it is not possible for regulators and lawmakers to ignore the impact of, and the demand for, captive power. The captive power or inside the fence market is a well-established outsourced energy solution, with more than 120GWE installed so far in developed markets such as the EU and Turkey. Though most captive power tends to operate independently of the grid, in some instances it may connect to the grid for the sale of unutilised excess power or as a back-up power source. Therefore, captive power may be grid-connected or off-grid and all types of technologies are utilised. The size of the plants can range from large thermal baseload to small scale solar photovoltaic. The drivers that motivate the development of captive power projects are similar both in emerging markets and developed countries, and include security of supply, energy efficiency and optimisation, cost reduction, and independence.

Thus, the utilisation of captive power can free up limited generation and transmission capacity for other consumers. As electricity generation is a regulated and strategic activity, energy regulators tend to take an interest in these projects, sometimes by requiring that the PPA between the project company and the host be filed with them for the purpose of being able to record the capacity and the tariff. If a captive power project is connected to and synchronised with the grid, then regulators also need to ensure that grid codes are adhered to. As a result, grid-connected captive power plants do not often escape licensing and permitting requirements and their associated fees.

Captive power plants may have negative effects on utilities. These negative effects arise if the most creditworthy customers choose to install their own captive power projects, leaving the utility to serve customers that are less creditworthy. This revenue stream cannot be substituted, as developing countries do not have many large-scale customers. In order to make up the loss of revenue, the only opportunity is to increase the average tariff across the remaining customer base. This increased tariff then provides more customers with additional reasons to install captive power plants. The utility then suffers further losses in revenue and tariffs have to be further increased. This conundrum can largely be avoided if tariffs are cost-reflective and power supply is reliable.

Captive Power PPAs

The bilateral PPA and tariff negotiations between the project company and the host need to address many considerations that are not present in PPAs with utilities or national supply companies. The primary differences are:

- The offtaker may have a limited ability to access long tenor debt based on the country's credit rating, or more often the absence of a rating.
- The offtaker's credit support may be provided by a parent company guarantee as opposed to a sovereign guarantee. The contingent liability is then borne by the corporate entity.
- With a parent company guarantee, the terms that the project company can then access in the market for debt are based on the credit quality of the offtaker's corporate balance sheet. The stronger it is, the more favourable terms (longer and cheaper) the offtaker can access.
- If project finance debt is to be raised, then the tariff structure will be based on the dispatch regime agreed to. If dispatchable power is available, then a capacity (or availability) and energy charge is applicable. If non-dispatchable (such as rooftop PV) then the PPA will include an energy-only tariff.

As an example, in a combined heat and power (**CHP**) project, captive plants are generally baseload and supplementary to the host's total load. The host is likely to remain connected to the grid for their make-up supply, as in most instances captive power does not provide all the required power. The host will thus still incur maximum demand charges, connection, and other fees payable to the grid or supply company. These elements then have to be factored into the total payment for the block of power purchased from the project company.

In the case of CHP, the host is likely to be already purchasing and transporting fuel to its site to produce steam, so the fuel risk is easily borne by the offtaker.

Considerations

When lending to a project company in a captive power project, the credit rating of the offtaker must be considered, as the revenues of the project company remain a single source from the offtaker. The complexity for captive power plants is that the offtaker is still exposed to sovereign risk such as changes in law, expropriation, civil unrest, and foreign convertibility, and transferability risk. With a creditworthy parent company guarantee, these risks are mitigated; however the terms on which project loans will be available will be limited by the credit of the offtaker or its parent guarantor.

10.3. Cross Border Power

Cross border power transactions are facilitated by bilaterally-agreed PPAs and via competitive regional markets. For the purposes of this chapter only bilateral PPAs are considered.

The parties to cross-border trades may be:

1. two state owned utilities
2. a private project company and a state-owned utility as offtaker
3. a private company as an offtaker from a state-owned entity or private project company as seller
4. a project company on the border between two (or more) countries (for example hydroelectric projects located on rivers that form national boundaries) and private or state owned offtakers.

The sale of power across borders is commonly preceded by intergovernmental MoUs that allow the transactions to occur. Other regional and bilateral trade protocols may also be applicable. A common arrangement for attracting a private developer is for a host utility to procure the power plant and then on-sell to other regional utilities. In this way, cross border protocols and intergovernmental MoUs can be respected and controlled by governments. The procurement process for contracting a private developer to construct the plant is simplified and the private developer is not exposed risk across two countries. An example of this arrangement is the ZESCO (Zambia) – EDM (Mozambique) – Kapower transaction. Care must be taken to ensure that interface risk is minimised.



Cross Border PPAs

Many bilateral cross border agreements purport to be PPAs but, on closer inspection, they are actually electricity supply agreements. Some of the differences in a supply agreement compared to a PPA are:

1. A supply agreement may include firm or non-firm commitments, without any defined consequences for default or termination, to supply a certain amount of energy for a period, at an agreed tariff.
2. A non-firm commitment means that the selling utility may, or may not, make power available to be sold under the supply agreement.
3. Take or pay obligations would not be included unless the supply agreement contained a firm commitment to them.
4. Penalties backed by security for supply loss (load shedding) do not exist.
5. Termination provisions are nonexistent or vague.

As a result of the above features, supply agreements are usually not capable of attracting long-term debt finance.

Governments may view supply agreements with some skepticism because security of supply cannot be guaranteed. However, they do provide a more flexible arrangement for the trading of power on a bilateral basis where governments can ensure that their own security of supply is assured prior to exporting any power with no consequences for nonpayment or for not making the agreed capacity available.

Supply agreements are particularly relevant when new transmission infrastructure needs to be constructed and developers (which may be private or public actors) intend to use the supply agreements as a bankable source of revenue. The principles outlined in this book are applicable to

the extent that the transmission wheeling charges will support project-financed debt for the transmission infrastructure. Supply agreements are generally not bankable, therefore many projects cannot raise project financed debt and resort to public sector debt raised via host governments. In many instances, these loans take the form of grants or concessional loans that are then on-lent to the state-owned utility for the construction of the assets, as debt cannot be raised on a limited recourse basis.

Some cross border trades include the use of a transmission system that may not belong to the buyer or the seller. This occurs when two countries who are not neighbors wish to trade electricity. In order to do so, they may transmit (or “wheel”) energy across a transmission system located in a third country by paying the owner of the transmission system a transmission use of system (or wheeling) charge.

Typical Considerations in Cross Border PPAs

Some issues that need particular attention in cross border PPAs are as follows:

1. **Applicable law:** This becomes important where countries are aligned to different legal systems. Governments often have to be practical and choose a single legal system to adhere to for project agreements including the PPA.
2. **Connection point:** Usually in cross border transactions the connection point is defined at the border and the risk transfers at the border. Additional complexity is introduced when another transmission system between the two countries is introduced.
3. **Cascading faults and other system disturbances causing power interruptions and load shedding:** Faults in remote parts of the network or in other networks can result in interruption to the cross border flow.

4. **Currency:** Cross border projects also introduce multiple currencies that are applicable where transactions are not completed in a common monetary area. A currency needs to be agreed to avoid currency mismatches. In the event that foreign currency debt needs to be raised, the utilities can agree to settle payments in currency in which the debt is denominated to avoid mismatches.

Examples of Interesting Cross Border Agreements

- **Copperbelt Energy Corporation (“CEC”)** in Zambia is the only private entity that has interest in a cross border transmission asset in Africa. CEC funded and built the transmission line. CEC owns the Zambian section of the transmission line and SNEL, the utility in Democratic Republic of Congo (“DRC”), owns the DRC section of the transmission line. SNEL purchases all its imported power via CEC (who acts as the trader) and pays CEC a wheeling charge for the power it imports.
- **Motraco** is a unique model of a multiple-utility owned SPV that constructed, owns and operates the transmission asset across three countries (Mozambique, Swaziland and South Africa). In order to ensure that baseload power is supplied to the MOZAL smelter in Maputo, Billiton entered into a PPA with Eskom. The power is wheeled via the Motraco cross border network and Motraco is paid a wheeling charge. The initial debt raised for the transmission line construction was guaranteed by Eskom on the back of the PPA.
- The **Ethiopia-Kenya Interconnector** is a public sector project where two utilities have entered into a cross border PPA and the agreement facilitated the construction of the transmission line between the two countries. Ethiopia supplies firm and non-firm power to Kenya at an agreed tariff. Even though the infrastructure was funded through concessionary loans and grants via the government, the PPA does provide for penalties for non-supply of firm power.

10.4. Emergency Power

Situations may arise where the offtaker does not have the time to competitively procure and negotiate a PPA to provide a long-term supply of cost-competitive electricity. In times of emergency, there can be an immediate need for additional generation capacity across or in specific parts of the grid, whether as a result of a breakdown of the transmission or production units due to natural disasters, political events or major maintenance issues or seasonal shortfalls in power production. Emergency power solutions are intended to be short term solutions which bridge to longer term power supply solutions.

Typically, emergency power projects (**EPPs**) attract developers who propose mainly thermal technology solutions which can run on diesel, heavy fuel oil (HFO) and sometimes natural gas. Emergency power plants have minimal balance of plant construction requirements and can be relocated at low cost. The mobility of the components of the power plant are a critical feature for emergency power plants; since assets are not 'trapped' or fixed, the project developer will be more willing to finance the installation from its own balance sheet. While this can speed up the execution of financing, this balance sheet financing will also demand a higher rate of return and must be repaid over a far shorter PPA duration, resulting in more expensive tariffs than a competitively procured, longer term conventional project-financed PPA as previously discussed in this book.

Procurement and Negotiation

Due to the immediacy requirements for EPPs, it is common for the host government/offtaker to use specific provisions in the procurement legislation that will allow the offtaker to avoid the application of the otherwise applicable legal requirements for procuring power. Hence, the

procurement of an emergency power plant is rarely the result of a competitive process and will most likely be based on one or a few unsolicited bids. Furthermore, the offtaker's negotiation leverage may be weaker given the urgency to remedy the electricity supply crisis, resulting in a skewed PPA risk allocation because of the compromised negotiation dynamic.

Emergency PPAs

EPP PPAs share some elements of the provisions covered in the preceding sections of this handbook. However, the following terms of the emergency PPA may be different from the competitively tendered and negotiated PPA:

- The tariff will be higher and will usually be comprised of capacity payments and energy payments.
- The timeline to reach commercial operations will be shorter.
- The term will be shorter (to respond to the period of emergency).
- The project company owns the generation assets, which can be easily decommissioned and relocated. Therefore, a transfer of the asset to the offtaker at early termination or the end of the PPA term is uncommon.
- The PPA may contain early termination rights in favour of the offtaker so that the offtaker can terminate the PPA in the event that the emergency is overcome before the term expires naturally.
- Termination payments for offtaker default are often linked to the costs incurred by the project company, up to an agreed cap. Project company default typically also has a capped penalty.
- In some instances, the government may take responsibility for fuel supply and enter into a tolling agreement with the project company.

Practice Tips

Due to the temporary nature of emergency power projects, the right of the offtaker to terminate the PPA should be negotiated with care. Ideally, the offtaker would want to have the right to terminate at any time, which is likely to be as soon as an alternative cheaper source of electricity becomes available. The emergency power project company will typically want to recover the costs resulting from the termination of the PPA and be compensated for the expected return over the period of the PPA, for example the cost of decommissioning the plant plus the return it would have earned during the contracted term of the PPA. When possible, it is preferable to negotiate this aspect from the onset and to cap the amount to be paid upon termination.

Considerations

EPPs are meant to respond to specific needs that are well-defined in time. Nevertheless it is important for the offtaker to approach these projects with the same care as for conventional project financed PPAs. Ideally, the offtaker should have a clear implementation plan and exit strategy before entertaining any emergency power projects, and should strictly utilise this approach for real emergency situations.

Many EPPs in emerging markets have had contracts extended due to poor capacity planning in the sector. An offtaker therefore runs the risk of significantly increasing the overall electricity cost for an extended period of time, negatively impacting the long-term sustainability of the electricity sector.

Finally, given that emergency power procurement may entail a deviation from the procurement processes that an offtaker is ordinarily required to use, care must be taken to ensure full disclosure and transparency.

10.5. Summary of Key Points

PPAs can be entered into for projects that differ from the traditional projects discussed elsewhere in this book. These different situations are summarised below.

Captive Power PPAs: These PPAs can be entered into for on-grid or off-grid power plants. The parties are usually two private entities. The credit quality of the offtaker will require careful investigation and a parent company guarantee is often required for local operations in order to raise project finance debt. Sovereign support for the transaction will not normally be available. Risk allocation remains similar to traditional PPAs.

Cross border PPAs: These contracts are normally drafted as supply agreements. If project finance debt is to be raised to fund the construction of infrastructure utilising the revenue stream from a cross border agreement, due consideration needs to be placed on appropriate risk allocations, security and penalties for defaults and termination. Parties need to agree on the applicable law for the contracts, the connection point, cascading faults and load shedding risk, and must choose a common currency that avoids currency mismatches.

Emergency Power PPAs: These contracts are often not utilising to raise project finance debt. The project developer will usually develop a mobile plant with equity and corporate debt. Terms tend to favour the developer and tariffs tend to be higher. Due to the emergency nature of the power plant, competitive procurement procedures may not always be required or used. Extra attention will be required to protect the offtaker's interests.

Glossary

Arbitration - a dispute resolution mechanism where the matter in dispute is referred for determination by an arbitral panel in accordance with a pre-agreed set of rules.

Assignment - a legal term describing the act of transferring the rights of a party under an agreement to another party. The right of a party to assign its rights under an agreement will be subjected to restrictions and limitations set out in the relevant agreement and may require the prior consent of other parties to the agreement.

Back-to-back - mirrored contract provisions in different contracts to pass risk to another party. More precisely, in relation to an obligation, means the ability of the obligor to pass on the risk of such obligation to another party. This is normally achieved through third party contracts.

Baseload power or capacity - generating capacity within a national or regional grid network that the offtaker or grid operator intends to dispatch or utilise on a continuous basis.

Capacity payment - a payment for capacity by the offtaker which is based on the ability of the power plant to generate a certain output. The payment is designed to allow the producer to recover its fixed costs (principal, interest, return of and return on equity and fixed operating costs). These charges are paid so long as the power plant is made available or deemed available for dispatch, regardless of whether the power plant is actually dispatched.

Carry forward - an amount of entitlement that is not immediately utilised by the party so entitled, which is added to the entitlement of the party in the next period of entitlement.

GLOSSARY

Collateral - property, contract rights, or other assets in which a borrower grants a security interest to a lender as security for the project company's obligations under the loan agreement.

Combined heat and power - a technology that generates electricity and captures the heat that would otherwise be wasted to provide useful thermal energy.

Commercial Operations Date or *COD* - a key milestone date defined in the PPA when the power plant commences commercial operation, usually as certified by the independent engineer.

Concentrated Solar Power or *CSP* - a form of solar power generation whereby a circular arrangement of mirrors or lenses are focused onto a water tower to create steam to enable generation of electricity through a steam turbine.

Concession - the right granted by the host government to build and operate the power plant and sell electricity in the host country for a number of years. A concession agreement is the agreement by which the concession is granted to the project company. An implementation agreement could serve a similar purpose.

Conditions precedent - a set of conditions that must be fulfilled before a contract or parts of it become effective, usually in the context of the PPA and drawdown under the loan agreements.

Consequential loss - please refer to the definition of Direct Loss.

Contingent liability - a liability that has not yet materialised but which may materialise in the future.

Corporate finance - used to distinguish Project Finance (see below). Corporate finance implies that the lender has recourse to the borrower's total assets over and above the asset being financed.

GLOSSARY

Cure period - the time period during which a defaulting party has a chance to correct a breach which would otherwise lead to an event of default.

Curtailment - an instruction by the offtaker or grid operator to the power producer of a non-dispatchable power plant to reduce generation. This may be motivated by end-user demand, the availability of alternative generation resources, transmission network capacity and/or grid stability.

Debt Service Reserve Account or *DSRA* - in the context of the loan agreement, a special debt reserve account denominated in the currency of the loan, which the project borrower funds with available project cashflow, up to an amount that is sufficient to cover the scheduled debt service obligations of the project borrower for an agreed period of time.

Decommissioning - the obligation of the project company to dismantle the power plant and clean up the project site upon the expiry of the term of the concession.

Deemed capacity - the capacity that a power plant would have been able to make available, but for the occurrence of an event or circumstance for which the offtaker bears the risk.

Deemed completion - the date on which a power plant would, but for the occurrence of an event for which the offtaker bears the risk, have achieved the COD.

Deemed generation - the electricity that a power plant would have been able to generate, but for the occurrence of an event or circumstance for which the offtaker bears the risk.

Delivery point - the point to which a producer is responsible for delivering electricity generated by the power plant. The delivery point is typically on the high voltage side of the step-up transformers. The electricity that is generated by a power plant is measured at the delivery point.

GLOSSARY

Developer - the party who undertakes the initiation and origination of the project. The developer may not necessarily be the Sponsor, who contributes equity to the project company.

Development Finance Institutions - financial institutions with a mandate to finance projects that achieve developmental outcomes. Examples include the World Bank, AfDB, OPIC, FMO, DEG, CDC, DBSA and Proparco.

Direct agreements - contracts or agreements between lenders and counterparties of the project company (including the offtaker and, where relevant, the host government), under which the relevant project counterparty acknowledges the security interests granted by the project company to the lenders, and allows lenders the opportunity to step in to remedy breaches by the project company. Direct Agreements may also be used to clarify/amend the underlying project contract.

Direct loss - a loss arising directly as a result of a defaulting party's failure to perform its obligations under the agreement.

Dispatch - an instruction by the offtaker or grid operator to the power plant to produce electricity.

Dispatchable plant - a power plant that is capable of responding to the instructions of the transmission company on demand to vary its output on short notice. Plants that fall within this category include coal-fired plants, gas-fired plants, and renewable plants with a relatively constant or storable source of energy such as a hydro plant with reservoir and/or a biomass plant.

Drawdown - in the context of a loan, means the advance of funds from the lender to the borrower.

Effective date - the date on which the PPA comes into effect. The conditions to the effective date will vary from project to project, but will often include financial close.

Emergency power project - a power project that is intended to address a short-term shortage of generation capacity.

Energy payment - a payment for electricity by the offtaker which is based on the actual amount of power generated and dispatched. The payment is designed to allow the producer to recover fuel costs and variable operating costs. In the context of renewable energy there is only an energy (unitary) charge as no Capacity Payments are used.

Engineering, Procurement and Construction Contract or EPC Contract - one or more contracts to be entered into between the EPC contractor and the project company for the purpose of setting out terms and conditions for the design, engineering, procurement of materials and equipment, construction and commissioning of the power plant.

Equator Principles - risk management framework adopted by financial institutions for determining, assessing and managing environmental and social risk in projects, primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making.

Equity - money invested by the Sponsors in the project that is not borrowed by the project company. The term “Equity” may sometimes be used to include shareholder loans (which is finance made available to the project company by the sponsors or shareholders of the project company, and is subordinated to debt made available by the lenders).

Equity contribution agreement - obliges the owners of the power plant to make equity contributions to finance the portion of the power plant not being financed by lenders.

Event of default - a default that the parties to a contract agree is a material default. The occurrence of an Event of Default usually grants the non-defaulting party the right to terminate the contract if such default is not cured within any applicable cure period.

GLOSSARY

Feasibility study - a technical and financial study of the viability of the proposed power project.

Financial close - either (a) the execution of the Financing Documents, or (b) the execution of the Financing Documents and the satisfaction of all of the conditions for the first disbursement of the project loans.

Financing documents - the set of contracts and agreements other than the project documents (including the Loan Agreements, Direct Agreements and Security Agreements), that define the rights and obligations of the lenders and the project company in relation to the financing of the power plant.

Force majeure event - an event beyond the control of the affected party that prevents it from performing one or more of its obligations under the relevant contract. Events constituting force majeure are generally further classified into Political Force Majeure Events and Non-Political Force Majeure Events, with different financial and contractual consequences to the contracting parties. Natural Force Majeure falls within the latter category.

Fuel supplier - a supplier of fuel used to generate electricity.

Fuel supply agreement - the agreement between the project company and the fuel supplier (in the case of a conventional PPA), or between the offtaker and the fuel supplier (in the case of a tolling agreement or energy conversion agreement), under which the fuel supplier supplies fuel to the project company.

Fuel transportation agreement - an agreement providing for the transportation of fuel from the fuel supplier to the project company.

Generator see *Seller*.

GLOSSARY

Grid - a system of high-tension cables by which electrical power is distributed throughout a region.

Hard currency - See *Reserve Currency*.

Heat rate - a measurement of the efficiency of a power plant in converting a unit of fuel into a unit of energy. Heat rates are typically described in terms of MMBtu (LHV) per kWh or GJ(LHV)/kWh.

Heavy fuel oil - a hydrocarbon product that consists of the highly viscous and tar-like residues of the crude oil refining process.

Host government - the government of the country in which the power plant is located.

IFC Performance Standards - a set of standards developed by the IFC that are designed to help identify, avoid, mitigate, and manage any adverse social or environmental impacts that may be created by a power project.

Independent Power Producer or IPP - a privately-owned producer of electric power.

Insolvency - the inability of an entity to pay its debts when or as they become due.

Interconnection - the point at which the transmission system and the power plant interconnect.

Interconnection agreement - an agreement between the project company and the transmission system operator providing for the connecting of the power plant to the transmission system.

Internal Rate of Return or IRR - the discount rate which, when used to discount the future cashflows of a project, will provide a net present value of zero.

Investor see *Sponsor*.

Kilowatt hour - a measurement of energy which is equal to 1,000 watts of electricity being generated or consumed continuously for a period of one hour.

Lenders - the providers of loan financing to the project company.

Liquidated damages - a contractually agreed, fixed amount of damages to compensate one party to a contract for a breach by the other party.

Liquidity - the availability of cash and cash equivalents to cover a party's short-term financial obligations.

Loan agreement - documents the commitment of the lender to make a loan to the project company to finance the power project, and the obligations of the project company to repay the loan with interest and to comply with various covenants set forth in the loan agreement.

Long-stop date - the final deadline for the achievement of a significant milestone in a contract, such as the fulfilment of the conditions precedent to the parties' obligations under the agreement, the achievement of financial closing, or the achievement of the commercial operations date.

Long Term Service Agreement or *LTSA* - an agreement under which the equipment supplier will provide certain maintenance services on a power plant at regular intervals during the term of a PPA and/or will provide certain spare parts that are necessary in order to operate and maintain the power plant.

Make-whole - the act of putting a party in the same position as if the event that caused a loss or reduction of benefit has not occurred.

Material breach - a serious breach by a party of its obligations under an agreement.

GLOSSARY

Megawatt- a measurement of power meaning 1,000,000 watts.

Merchant power plant - a power plant that sells electricity to a competitive wholesale market instead of under a PPA. The offtake of electricity from a merchant power plant is governed by market forces, thereby exposing the project company to significant market risk.

Misrepresentation - a statement or representation made by one party to another which is proved to be untrue.

Net Electrical Output - the net electrical energy, typically expressed in MWh, that is generated by a power plant and delivered to the delivery point, as measured by the metering system located at the delivery point.

Non-dispatchable plant - a power plant that is not capable of responding to instructions from a transmission system operator to vary its output.

Non-political force majeure events - a force majeure event that is not a Political Force Majeure Event.

Non-recourse financing - financing that will be repaid solely from an identified source of revenues. Non-recourse financing is usually provided to a special purpose vehicle. The obligations of the shareholders in the special purpose vehicle are usually limited to their obligation to contribute equity to the special-purpose vehicle.

Novation - a legal mechanism by which the rights and obligations of a party under a contract are transferred to third party.

Offtaker - the party to a PPA whose obligation is to purchase the capacity made available and the electricity generated by the power plant, subject to the terms and conditions of the PPA. Also referred to as the Buyer.

Operating and Maintenance Agreement or O&M Agreement - the agreement between the project company and the operator under which the operator operates and maintains the power plant.

Pass through - in relation to a cost, a mechanism under which the project company passes such cost on to the offtaker by operation of the tariff.

Political force majeure event - a force majeure event that is political in nature. Typically, these would include any act of war, conflict, act of foreign enemy, blockade, embargo, or revolution, strikes of a nationwide or politically motivated character, changes in law, and the revocation or non-issuance of concessions or other authorizations.

Power Purchase Agreement or PPA - a contract between two parties, one of which produces or generates power for sale (the project company) and one of which purchases power (the offtaker). This contract is sometimes referred to as an “offtake” agreement.

Producer see *Project Company*.

Project Company - the entity which is selling power under the PPA. Also referred to as the *Seller*, *IPP* or the *Producer*.

Project documents - the contracts or agreements required for the construction, operation and maintenance of the power plant. Typically, this will include the Power Purchase Agreement, the EPC Contract, Fuel Supply Agreement, Operations and Maintenance Agreement and the Interconnection Agreement.

Project finance see *Non-Recourse Financing*.

Project loan - a loan from one or more lenders to the project company, made for the purpose of financing a power project.

Project works - the civil works, balance of plant and electro-mechanical equipment that will, once completed, constitute a power plant.

Public Private Partnerships or PPP - arrangements between the public and private sectors whereby a service or piece of infrastructure that is ordinarily provided by the public sector is provided under Concession by the private sector, with clear agreement on the allocation of associated risks and responsibilities.

Put-and-Call Option Agreement - agreement between the project company and the host government in terms of which either party can exercise its rights to force a purchase or sale of the project assets upon the other party.

Regulator - competent authority of the host government having the statutory right to regulate the project and the project company.

Request For Proposal or RfP - an invitation from the host government, the offtaker, or in some markets, the Regulator, to potential investors to submit a proposal to develop a power project.

Reserve currency - see *Hard Currency*.

Run of river - in the context of a hydroelectric plant, a hydroelectric plant without a reservoir of any significant size which relies primarily on rainfall and subsequent river flow for generation.

Security documents - the documents that grant the security interests, mortgages, pledges and other security rights that secure the repayment of the project loans in favour of the lenders.

Seller - see *Project Company*.

Several liability - means that each party is separately responsible for its own performance and the consequences of its failure to perform.

Site - the land upon which the power plant is located.

Sovereign Support Agreements - can include sovereign guarantees, comfort letters, put and call option agreements and other forms of sovereign support that enhance the creditworthiness of the offtaker and other government entities involved in the project.

Special Purpose Vehicle or SPV - a corporate entity established specifically for the purpose of pursuing a specific project which is prohibited from undertaking any activity beyond the project in question. Often called the project company for the purposes of this handbook.

Sponsor - the Equity provider to the SPV.

Spot market - in the context of the supply of electricity, the wholesale electricity market into which the project company can sell electricity other than under a long-term PPA. In the context of a fuel supply arrangement, the market from which the project company can acquire fuel without entering into long-term fuel purchase obligations.

Step-in rights - the rights granted to the lenders under a Direct Agreement to step-in and cure a default by the project company, under a project agreement, before the counterparty to the project company may take any action to enforce the contract against the counterparty or terminate the contract.

Take-and-pay - in the context of a PPA, the obligation of the offtaker to accept delivery of and pay for electricity actually generated by the power plant.

Take-or-pay - in the context of a PPA, the obligation of the offtaker to pay for electricity made available by the power plant regardless of whether the electricity is actually generated.

Term - the period of time during which a contract will remain in force, unless terminated earlier by either party in accordance with the terms and

GLOSSARY

conditions of the contract. The term of a PPA is usually expressed to run until a date falling a fixed number of years after COD.

Tolling agreement - in the context of power projects, an agreement under which a party, usually the offtaker, agrees to provide fuel to the power producer that will be converted into electricity for the benefit of the offtaker.

Volts - a derived unit for electrical potential.

Acronyms

AfDB—African Development Bank

BOO —Build Own Operate

BOOT—Build Own Operate Transfer

BOT—Build Operate Transfer

CHP—Combined Heat and Power

COD—Commercial Operations Date

CP—Conditions Precedent

CSA—Credit Support Agreement

CSP—Concentrated Solar Power

DBA—Design Build Agreement

DFC—United States International Development Finance Corporation
(formerly OPIC)

DFI—Development Finance Institutions

DSCR—Debt Service Coverage Ratio

DSRA—Debt Service Reserve Account

EBRD—European Bank for Reconstruction and Development

ECA—Export Credit Agency

EIA—Environmental Impact Assessment

ACRONYMS

EIS	—Environmental Impact Statement
ESIA	—Environmental and Social Impact Assessment
EPC	—Engineering, Procurement and Construction (contract)
EPCM	—Engineering, Procurement, Construction and Management Agreement
EPP	—Emergency Power Project
EURIBOR	—Euro Interbank Offered Rate
FM	—Force Majeure
FME	—Force Majeure Event
FMV	—Fair Market Value
FSA	—Fuel Supply Agreement
GJ	—Gigajoule
HFO	—Heavy Fuel Oil
IA	—Implementation Agreement
ICA	—Infrastructure Consortium for Africa
ICC	—International Chamber of Commerce
ICSID	—International Centre for Settlement of Investment Disputes
IDC	—Interest During Construction
IE	—Independent Engineer

ACRONYMS

IFC—International Finance Corporation

IPP—Independent Power Producer/Project

kW—kilowatt

kWh—kilowatt hour

LD—Liquidated Damages

LHV—lower heating value

LIBOR—London Interbank Offered Rate

LC—Letter of Credit

LCIA—London Court of International Arbitration

LTSA—Long Term Service Agreement

MAE—Material Adverse Effect

MDB—Multilateral Development Bank

MIGA—Multilateral Investment Guarantee Agency

MMBtu—Million British Thermal Units

MW—Megawatt

MWh—Megawatt hour

O&M—Operations and Maintenance

OPIC—Overseas Private Investment Corporation (see DFC)

PCOA—Put and Call Option Agreement

ACRONYMS

POD—Point of Delivery

PPA—Power Purchase Agreement

PPP—Public Private Partnership

PRG—Partial Risk Guarantee

PRI—Political Risk Insurance

PV—Photovoltaic

PQ—Pre-Qualification

RfP—Request for Proposal

SOE—State Owned Entity

SPV—Special Purpose Vehicle

T-Line—Transmission Line

UNCITRAL—United Nations Commission on International Trade Law

VAT—Value Added Tax

WCLC—Working Capital Letters of Credit

Other Resources

The following is a non-exhaustive list of additional online resources:

Country Risk Classifications

Standard & Poor's Country Risk Ratings: <https://www.spglobal.com/ratings>

Environment and Social

- African Development Bank's Integrated Safeguard System: <http://goo.gl/hWTO5p>
- Equator Principles: <http://www.equator-principles.com>
- IFC Environmental and Social Performance Standards: <http://goo.gl/pNaCOv>

Development Finance Institutions

- Africa Finance Corporation: <http://www.africafc.org>
- African Development Bank Group: <http://www.afdb.org>
- Asian Development Bank: <http://www.adb.org>
- CDC Group plc: <http://www.cdcgroup.com>
- DEG German Investment Company: <http://www.deginvest.de>
- Development Bank of Southern Africa: <http://www.dbsa.org>
- European Bank for Reconstruction and Development: <http://www.ebrd.com>
- European Investment Bank: <http://www.eib.org>
- FMO Netherlands Development Finance Company: <http://www.fmo.nl>
- International Finance Corporation: <http://www.ifc.org>

OTHER RESOURCES

- Islamic Development Bank: <http://www.isdb.org>
- Proparco Investment and Promotions Company for Economic Cooperation: <http://www.proparco.fr>
- U.S. International Development Finance Corporation (DFC): <https://www.dfc.gov/>
- World Bank Group: <http://www.worldbank.org>

Negotiation Support

- African Legal Support Facility: <http://www.aflsf.org>
- Host Government Negotiation Support Portal: <http://www.negotiationsupport.org>

Power Sector Guides

- Africa Power Guide: <http://www.africapowerguide.com>
- Geothermal Handbook: Planning and Financing Power Generation by World Bank: <http://goo.gl/Ftms70>
- IEA Wind Power Technology Roadmap: <https://bit.ly/2xWYQ3d>
- Important Features of Bankable Power Purchase Agreements by OPIC: <http://goo.gl/fBRXys>
- Power Africa: <http://www.usaid.gov/powerafrica>
- World Energy Outlook 2014: <http://www.worldenergyoutlook.org>
- Eberhard, A. and Gratwick, K. N, *Demise of the Standard Model for Power Sector Reform and the Emergence of Hybrid Power Markets*, Energy Policy Volume 36, Issue 10. 2008. <https://stanford.io/2KwyOGS>

Procurement

- EIB Procurement Guidelines: <https://bit.ly/2x9Or42>
- South Africa's Renewable Energy IPP Procurement Program: Success Factors and Lessons: <http://goo.gl/1YnSGy>
- World Bank Procurement Guidelines: <http://www.worldbank.org/procurement>

Project Finance

- World Bank: Project Finance and Guarantee Notes: <http://goo.gl/rdCkTH>
- World Bank: Partial Risk Guarantees: <http://goo.gl/7z6ZQo>

Project Preparation

- ICA Assessment of Project Preparation Facilities for Africa: <http://goo.gl/MfLS92>

Public Private Partnerships

- Infrastructure Consortium for Africa: <http://www.icafrica.org>
- Unsolicited Proposals An Exception to Public Initiation of Infrastructure PPPs: <http://goo.gl/hXJgFZ>
- World Bank Public Private Partnership in Infrastructure Resource Center: <http://www.worldbank.org/pppirc>

POWER AFRICA UNDERSTANDING SERIES

Funded by



Developed by



Institutional Partners

