SAARC ENERGY CENTRE
Energy for Peace & Prosperity

On-line Training of SAARC Professionals on Power Purchase Agreements of Renewable Energy Projects

Mechanisms for Analyzing and Negotiating RPPAs

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Objective of the Presentation

- This Presentation will cover important elements of Renewable Power Purchase Agreements (RPPA) and consideration of key terms while negotiating a RPPA. Given the diverse regulatory and legislative practices on renewable energy in different countries, the RPPA becomes a very important element of any renewable energy (RE) project. We will learn examination and thoughtful negotiations of long-term PPAs considering some important elements as these RPPAs represent the first step necessary to make these projects bankable and facilitate obtaining financing.

Outline

- What is a RPPPA
- Importance of RPPA
- Risk Analysis in SAARC
- Analyzing Key Elements of a RPPA
- Key Terms for negotiating RPPA
- Some Associated Risks
- Way Forward

RPPA vs Traditional PPA

- A Power Purchase Agreement (PPA) is a broad term covers many types of contracts involving the purchase of energy between two parties.
- A renewable PPA is a long-term, **purchases of energy and RECs** from **a new** renewable energy project which is *not yet built*.
- A traditional power purchasing for facilities from wholesale or retail providers are operations-based, and, depending on the location, may be a utility-provided price fixing mechanism, a wholesale purchase, or something else.
- These traditional PPAs may be short term, or long term from existing sources and are structured differently than a renewable PPA.
- A renewable PPA, may offer *below market rates* in exchange for the ability to get the project financed with guaranteed revenues. This, in conjunction with the environmental attributes bundled with the energy (in the form of renewable energy credits, or RECs, offers users a very unique opportunity to buy long-term PPAs, a dynamic which has only existed in the past few years.

A Physical RPPA & A Virtual RPPA

Physical RPPA

- Physical PPAs are most commonly used by buyer having heavy, concentrated load.
- Under a physical PPA, the seller delivers physical renewable electricity to the buyer, who actually receives and takes legal title to the energy.

A physical PPA is structured as follows:

- The buyer buys renewable energy directly from a seller. In a typical renewable energy PPA, the developer builds, owns, and operates the renewable energy project, and sells the output to the buyer at a specified delivery point.
- The buyer takes title to the energy at the delivery point, as well as associated RECs(Renewable Energy Credit or Certificates)
- The buyer is responsible for moving the energy away from the delivery point to its load, typically done through network providers.

Virtual RPPA

- It is a financial contract without energy. The buyer does not receive, or take legal title to, the electricity and in this way, it is a virtual power purchase agreement.
- In a VPPA, a buyer agrees to purchase a project's output and associated RECs at a set fixed price. The developer then liquidates the energy at market pricing and passes the revenue through to the buyer. More specifically:
- Similar to a physical PPA, the seller in a VPPA is oftentimes a developer who builds, owns, and operates a project and delivers the energy output to the specified point.
- The Buyer agrees to pay the seller a fixed price for renewable energy delivered to a specific point, typically a market hub or project busbar. This fixed price set by the VPPA is the guaranteed price the developer will receive – no less and no more – irrespective of the floating market price.
- The seller generates and liquidates a project's energy at market pricing. When the floating market price exceeds the fixed VPPA price, the developer passes the positive difference to the buyer. When the converse is true, the market price is below the VPPA fixed price, the buyer must pay the developer the difference.
- The buyer retains all of the RECs associated with the delivered energy, as long as that is specified in the contract.

Why PPA is so Important

- PPA- heart of a Renewable energy project and all financings and operations are based on it.
- A legal as well as a commercial document between a power producer as seller and the purchaser
- Without signing a PPA project can not take off.
- Covers details of obligations of the power producer to generate and sellers to pay the price
- A long-term commitment
- Trade off risk & returns (technologies, Political, Social, environmental)

- PPA - equally important to lenders and investors
- PPA- shows creditworthiness of the project
- PPA- secures a healthy revenue stream from the Project- necessary to finance and/or to repay for the project.
- Economics of the project depends on the terms and conditions of the PPA
- PPA- covers the aspirations of Seller, Buyer, Investor, Fis, Regulators, Government and Consumers- requires to address their perceptives

Important Points while signing

- Current regulatory environment of the country in which such RE project is to be commissioned.
- Include provisions to lock in price and quantity and meet renewable power standards.
- Buyer and seller to consult experienced counsels while drafting and executing RPPAs.
- Full knowledge of the critical terms/ provisions/variations on the PPA geared to different RE sources.

- Negotiations/discussions of the key terms
- Adapting the RPPA to the type of RE used, and cleverly handle helpful strategies for effectively negotiating the agreement in correlation with interconnection, wheeling and ancillary services agreements.
- Power may be sold through a RPPA to a local utility or electricity utility, a more distant utility, or to a different wholesale or retail customer

- A Renewable energy project presents several challenges in the negotiation process as it Variable Energy Project.
- The intermittent and highly unpredictable nature of wind and solar power should be considered when determining price, working out demand and performance requirements of the machine.
- locations of power plants matters- transmission costs which would need to be addressed when discussing the economics of the project during negotiation of the RPPA

- various forms of RPPAs; these are differentiated by the source of RE harnessed (solar, wind, etc.).
- Financing for the project- delineated in the contract, specifies relevant dates of the project coming into effect, when the project will begin commercial operation, and a termination date for which the contract may be renewed or abandoned.
- Metering to provide both Seller and Purchaser with the most accurate information about the amount of electricity generated, sold and bought
- Metering Standards, Connectivity Standards, Regulations of Third party Sale, Market exposures to be examined.

- Rates for electricity- an economic incentive to both parties of the RPPA.
- Different types of concessions- BOT, BOO or BOOT type power generation project
- To consider available models of multi-currency loans and equity financing packages for RE generation plants
- These models are already available in many countries. Usually by using such financial models, financing institutions (lenders) evaluate any proposed RPPA in order to identify the relative importance of each of the variables found in such an agreement.

Key Elements of a RPPA

A. Term and Period of extension

B. Power Generation and pricing

C. Ownership

D. Compliance with renewable power standards-RPO

E. Access & Connectivity

F. RPPA legalities- Force majeure/Change of law

G. Green attributes

H. Environmental Credits

I. Tax duties responsibilities

- **PPAs for different renewables**

A. Solar
B. Wind
C. Geo-thermal
D. Bio-Mass
E. Small Hydro

- **Other Important project contracts**

A. Land Use
B. Interconnection
C. Ancillary services
D. Equipment supply
E. Operations
F. Permits

- **Strategies for negotiation**

Risk Analysis in SAARC

- **Construction risk**

Risks related to increase in overall financing cost due to construction related issues – esp. due to delays in construction due to permitting.

- **Land acquisition issues**

Issues faced in land acquisition, esp. if there is no single window clearance in place, or if the time taken to obtain clearances is high.

- **Transmission evacuation**

The lack of availability of transmission evacuation infrastructure, and time taken to get the clearances and permitting.

- **Curtailment issues**

Wind developers may face this issue during high wind seasons when higher than expected generation cretes oversupply situations as well as congestion.

- **Contract enforceability risk**

Drastic reduction in cost of solar power generation may result inpoor contract enforceability in the long-term.

- **Others Lack of trusted intermediaries**

Lack of trusted financial intermediaries may result in new and/or smaller investors staying away from the sector.

- **Limited understanding of sector**

Many investors are not aware of renewable energy sector and, therefore, prefer to make investments in mainstream asset classes.

- **Regulatory/policy risk**

The risks related to uncertainty in availability of incentive schemes, poor implementation of policies and non-uniform policies across states.

- **Net metering policies**

The net metering policies across states may lack coherency as well as poor implementation

Analyzing Key Elements

1. **Term of RPPA**

- Most RPPAs have term is 20 years (Ranging 15 to 25 years)
- legally binding once it has been executed- subject to early termination rights for both the parties
- End date of the RPPA is usually measured in the number of years from the commercial operation date.
- Can extend the Contract or a renewal term beyond the initial stated term
- Option to alter the price and terms if extended
- Early termination- RPPAs will include several provisions that will allow one or both parties to terminate the REPA early if certain events occur before commercial operation.
- Grounds of early termination

1) the Seller's or Purchaser's internal approvals, or any required regulatory or third party approvals, are not received

2) permits necessary for the construction and operation of the project are not obtained

3) the Seller has not entered into an acceptable interconnection agreement

4) in some cases, financing is not available

5) transmission access has not been secured

6) site control is not secured.

2. PRE-COMMERCIAL OPERATION OBLIGATIONS

Important Mile Stones by a EPC Contract

- Mechanical completion
- Performance testing
- Provisional acceptance
- Commercial operation

Construction Related Issues:

- From a buyer's perspective there are consequences to the late delivery/construction of a renewable energy facility to protect renewable energy credits or RPO associated with such power available on a timely basis.
- Commonly, a Purchaser will impose a liquidated damages regime (an obligation of Seller to pay buyer a fixed amount of money for each day of delay) to deal with the consequences of a renewable energy facility not being built in accordance with the project milestone timetable.

- Risk if an absolute deadline is missed.
- Force majeure provisions (party's performance for reasons beyond its reasonable control)- missing milestone deadlines-, PPA to mitigate this risk.
- Sufficiently long lead time for construction must be factored into any milestones to address grant of permit and regulatory delays and expected timing of procurement.
- Sellers may cover risk specifically included as force majeure in order to extend applicable milestones.
- Lenders will be very wary of a tight timetable where there is a risk of liquidated damages

- Breach of internal milestones could have the effect of multiplying liquidated damages.
- Careful drafting should avoid this by crediting liquidated damages for earlier breaches against those accruing in respect of a subsequent breach.
- Extensions of milestones for force majeure delay should not necessarily be day for day as a force majeure delay of short duration could cause an extensive delay where, for example, a window of opportunity for construction is lost.
- Consider an allowance in the number of modular facilities that must be commissioned to declare commercial operation of the RE facility for the purpose of stopping the clock running on delay liquidated damages sooner.
- Ideally, the Seller should ensure that it has the right to pass on the cost of delay liquidated damages to the construction contractor where the construction contractor is the cause of delay.

3. Post-Commercial Operation

A. Transmission issues are important part of RPPAs.

It is essential to consider the following matters:

- The Seller is often responsible for the costs of all transmission upgrades necessary to deliver the RE power output from the Re generation facility to the point of delivery, but sometimes Sellers negotiate for the right to pass some or all of these costs on to the Purchaser.
- The point of delivery is a specific point in the transmission system where the RE power output is deemed to be delivered to the Purchaser and the Purchaser assumes the risk of loss beyond that point.

- Costs for transmission upgrades are not the responsibility of the Seller.
- At the time a RPPA is negotiated and executed, it is common that the analysis and studies conducted by the transmission service provider are not complete. Thus, there is no final determination as to the allocation of costs for network upgrades.
- The Seller or the Purchaser may put any particular provision if the costs for needed transmission upgrades are unreasonable or exceed declared and agreed upon estimates

B. Commissioning Process

There are a number of steps involved in the commissioning process of an RE project that must be completed before the facility can reach commercial operation.

The RPPA contains of these steps as the milestones.

These conditions for commercial operation may require the **Seller to demonstrate** to the Purchaser that:

- the Seller has completed the financing documents, government permits, interconnection agreement, Seller's operating agreement, Seller's engineering, procurement and construction agreement and any manufacturers' warranties;
- an officer of the Seller has certified that the equipment installed at the facility has a maximum designed output equal to the agreed megawatts (MW);

- the facility has achieved initial synchronization with the interconnection provider's system;
- the communications systems reliably communicates with the Purchaser's systems;
- an independent professional engineer has certified that the facility has been completed in all material respects in accordance with the RPPA;
- the facility is performing under the interconnection agreement at a generation level acceptable to the interconnection provider without causing any abnormal or unsafe operating conditions on any interconnected system;
- a separate agreement is in effect to deliver energy to the facility to allow for RE facilities start-up and shut down and maintenance;
- certificates of insurance have been obtained;
- all permits, consents licenses, approvals and authorizations required by any government authority have been obtained.

C. Curtailment

- This item is critical.

The following principal considerations are always included:

- Most RPPAs require that the Seller deliver and sell to the Purchaser all the RE electricity generated by the facility.
- Times when the Purchaser, transmission owner or Transmission System Operator (TSO) may mandatorily curtail the electricity production from the RE facilities because of constraints on the system, emergency or other reasons-PPA to address.
- Curtailment can also be for the convenience of the Purchaser for it to best manage its available energy supply sources.
- During negotiation of a RPPA, the parties must decide who will bear the financial risk for losses that arise when the Purchaser, the transmission owner or the TSO exercises its curtailment right.
- RPPAs can be structured as “take-or-pay” agreements.

- Curtailment provisions have to be clearly discussed and written because they can directly impact the required pricing, or profitability, of the project.
- Various RPPAs differ regarding the conditions under which the Purchaser must pay for available capacity or energy that was not actually delivered.
- For example, in some RPPAs, the Purchaser pays regardless of the reason for the curtailment. In other RPPAs, the Purchaser pays for available capacity or energy only if the Purchaser exercised its discretionary curtailment right, not if the RE output was curtailed because of an emergency, force majeure event or another

- The parties usually agree to calculate available capacity and/or electrical power output based on RE source data available during the curtailment period and the power curve data for the RE facilities.
- The Seller is often required to construct and maintain adequate meteorological station(s) capable of measuring and recording representative RE source data 24 hours a day, and this data can be used to calculate the payment owed by the Purchaser for the curtailed energy.
- A compensation should be paid based on an agreed formula. If no compensation is provided, there should be, at the least, a cap on the amount of generation that can be curtailed.
- In case of any additional State tax imposed by any country, the amount the Purchaser must pay to the Seller because of curtailment should include both the agreed price for the MWs of available capacity or MWHs of electric energy output and an additional “grossed up” tax amount reflecting the loss.

4. SALE AND PURCHASE OF ENERGY

- It is important to indicate the following additional significant features on the obligations to sell and purchase as well as some additional information on pricing:
- Elaboration on particular features on obligations to sell and purchase Minimum and Maximum Delivery Obligations.
- Many RPPAs have a minimum annual delivery obligation or output guarantee, as well as a maximum purchase obligation.
- Power output for each year of the life of the RE power generation facility should be projected to fall within the **collar, that is, between the ceiling and the floor. Ideally, the collar should be structured to accommodate expected volatility in annual production.** The consequences of output falling below the floor or rising above the ceiling are as follows:

5. Energy pricing

Price terms vary depending on:

- the Purchaser's need
- Regulations of the country
- Structure of the project financing
- Quality of the RE resource
- Available transmission resources
- RE facilities performance characteristics and many other issues.
- Market prices for power from RE are affected by cost increase in RE facilities, equipment and labor land use rents.
- Prices are also affected by the geographic area where the project is built.
- Price terms are very important to project development, as the RPPA allows investors to estimate the total revenue available over the life of the project.

- If the price is too low, the project may not have a positive cash flow or the investors may be unable to earn a reasonable rate of return.
- If so, it is unlikely the project will be financed. Conversely, Purchasers have a keen interest in keeping the price low to ensure the utility can deliver low-cost electricity to its customers.
- Prices terms may remain flat, or may escalate or deescalate, over the life of the project.
- In addition, the RPPA typically provides for a lower initial rate, or trial price, that is applied to energy delivered to the Purchaser before the date of commercial operation, or in some cases, excess energy after commercial operation if too much energy is delivered.
- RPPAs usually address metering dealings, invoice and billing procedures. It is common for the Seller to provide a monthly invoice detailing RE power output delivered or available capacity. Timelines for payment, and billing dispute procedures, are often included as well

Pricing Structures

- Fixed Price – Fully fixed, Fixed with Escalation, Fixed with escalation index
- Floor, Cap and Collar – Reverse collar exclusive with VPPA
- Floating- Discount to floor, market, collar
- Hybrid

% of output: A combination of fixed and floating structures are determined by percentage of output (e.g. 60% fixed, 40% floating).

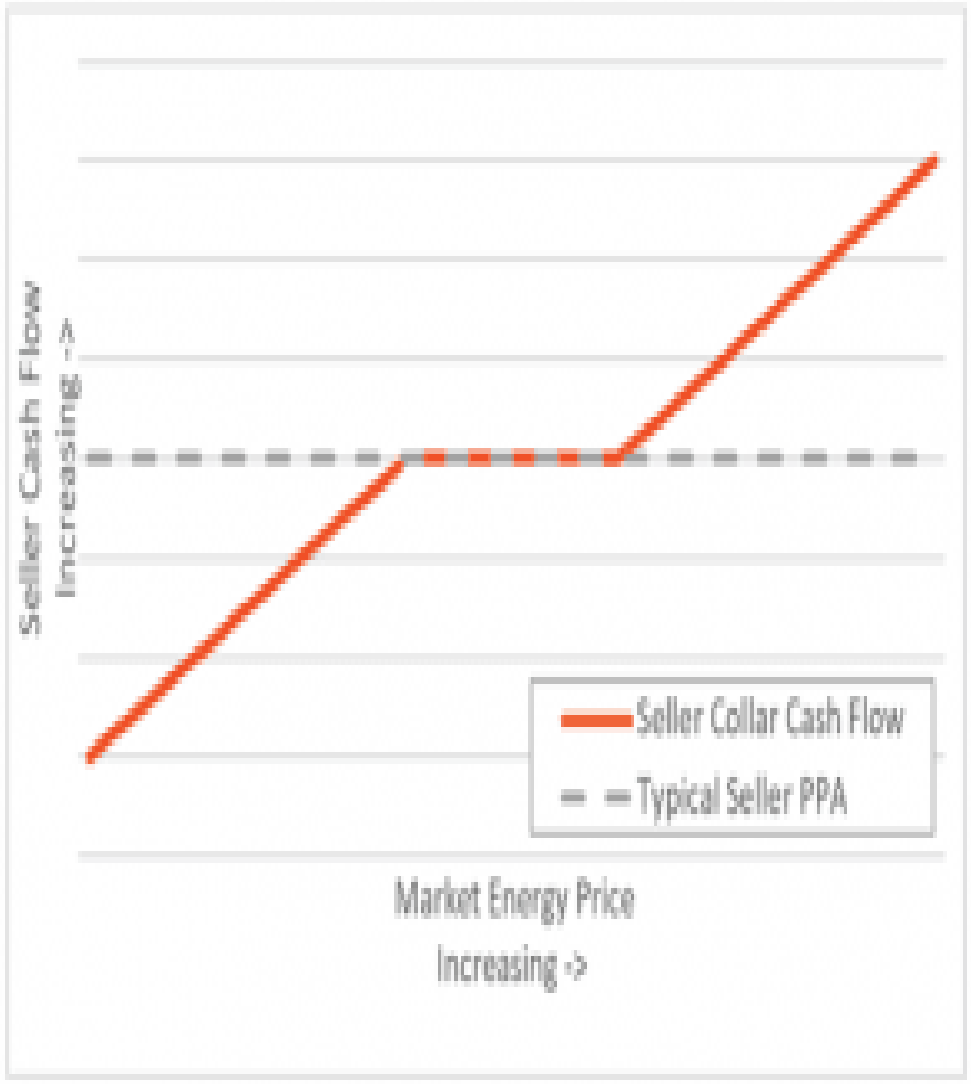
Over time: A combination of fixed and floating structures are determined by a set number of years (e.g. 4 years fixed, 6 years floating).

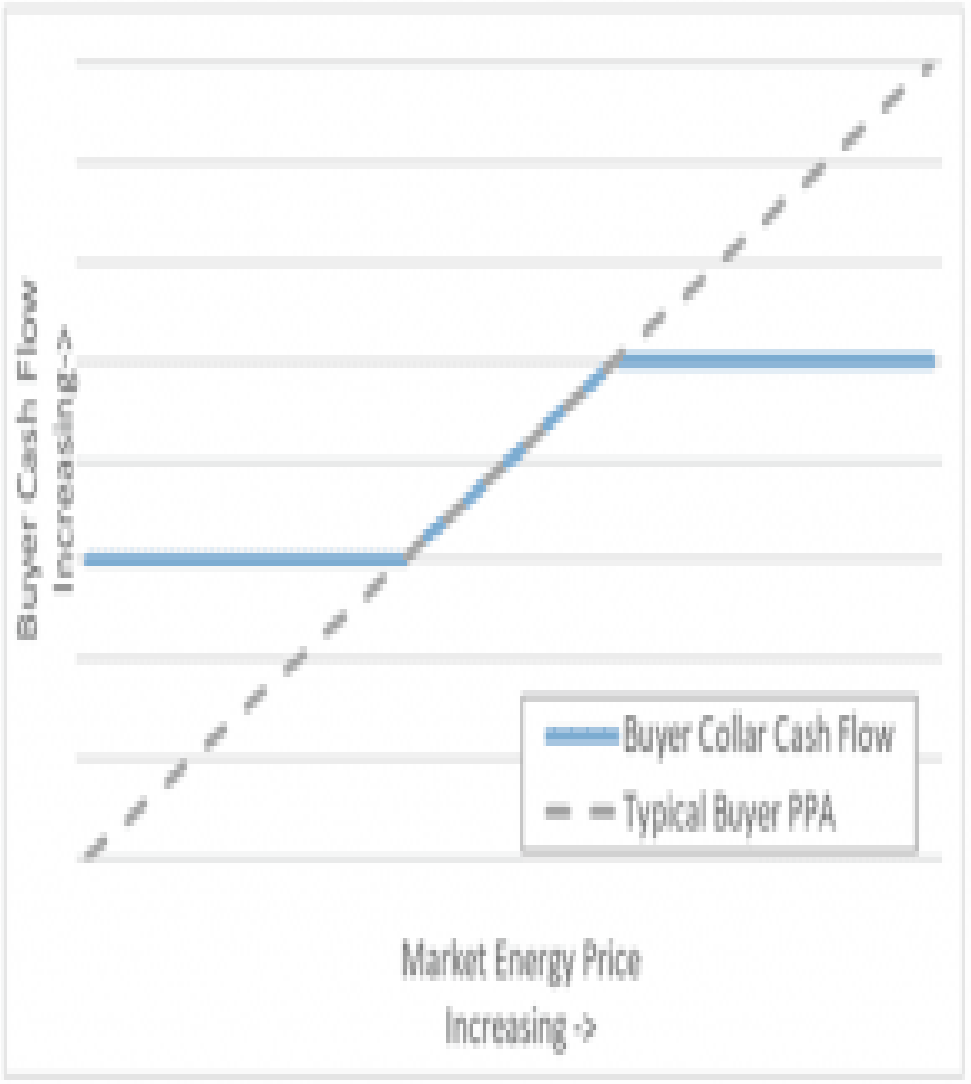
- Clawback

The buyer pays a fixed price but pays less when market prices fall below this price. If market prices rise again, the buyer will pay the seller above the fixed price only so far as the seller has clawed back the same amount that the buyer has made from the initial drop. The buyer then goes back to paying the fixed price.

Innovative Contract to Reduce Price Risk

- **Collar Risk and Mitigation**
- To mitigate price fluctuations.
- The collar sets upper and lower bounds on buyer's exposure to energy market price fluctuations, while ensuring strong and stable revenue for the project owner.
- A collar requires a project to assume more wholesale energy price risk than in a traditional PPA; however, it provides upside when energy prices are high. The result is more risk (and more potential benefits) than a traditional PPA, but less than a fully merchant project.


Seller Cash Flow
Increasing ->
Seller Collar Cash Flow
Typical Seller PPA
Market Energy Price
Increasing ->


Buyer Cash Flow
Increasing->
Buyer Collar Cash Flow
Typical Buyer PPA
Market Energy Price
Increasing ->

- **Seller Risk Mitigations**

- Tax equity may require a higher return, or indemnification from the project owner

- Additional instruments can be used to address downside risk but may not be available for full PPA term

- Project owners may ultimately bear downside risk below the floor, if sufficiently motivated by project economics

- **Buyer Risk Mitigations**

- Appropriately balanced collar structure to mitigate downside risk, and expected high probabilities of positive cash flow to buyer and project

- Credit support provisions, once PPA is executed, that place financing and development risk on seller, and if project fails, ensure damages to buyer

POWER PRODUCER CONSIDERATION

- **Source of financing**

Power producers relying more extensively on debt financing will typically gravitate to pricing structures that provide greater revenue visibility and bankability (e.g., fixed price or relatively narrow collars).

- **Size of power producer**

Larger power producers are typically better able to offer a wider range of pricing structures and varying levels of risk transfer due to a larger balance sheets and lower reliance on project finance. Smaller power producers may prefer simpler structures with more risk transfer (typically fixed price).

- **Industry structure/competitor actions in local market**

Local market conventions and competitor actions can play a significant role in determining favored pricing structures.

- **Level of vertical integration**

Power producers with a retail arm may be more amenable to floating price structures, as their retail offtake provides a natural price hedge to some of the floating price exposure

- **Forward price expectations**

All else being equal, power producers with upward price expectations will be more willing to accept floating structures, while those with downward price expectations will opt for fixed structures.

- **Other PPA terms** (e.g., % of output and term)

All else equal, power producers generally prefer fixed-price structures because they carry lower risk. However, a power producer may prefer a tracking structure (e.g., discount to market with floor) if it is for a greater percentage of the project output.

The PPA term is also a key pricing variable. The longer the term, the greater the price certainty for the power producer, which is generally preferred;

Buyer Consideration

- **Energy intensiveness of industry**

Companies in energy-intensive industries (e.g., metals, minerals, data centers, chemicals, etc.) use PPAs as tools to manage their electricity cost base. This can drive decisions to enter into fixed-price agreements to hedge against upward cost movements or discount to market with floor arrangements to maintain competitivity with the market.

- **Volume contracted**

Larger projects and corporate PPA volumes can benefit from economies of scale.

- **Percentage of electricity contracted**

The size of unhedged corporate consumption relative to project output may play a role in choosing a pricing structure. Corporate buyers are generally more accepting of a fixed price where the output is a smaller proportion of consumption.

- **Industry structure**

Certain industries pass through electricity costs either directly or indirectly (e.g., electric utilities, property and data center companies). This can reduce incentives to lock in a fixed price and lead buyers to cap and floor arrangements (with or without discounts to market). The preferences of the endusers (e.g., technology companies for data centers) and the company's contractual arrangements with its customers (i.e., contractual length) can be key determinators of the preferred price structure.

- **Credit standing**

Creditworthy companies find it easier to secure long-term competitive pricing.

- **End-consumer proximity**

Consumer perception of sustainability is a key driver for companies with end-consumer proximity that rely on branding (e.g., consumer products and financial services, etc.). The focus on brand and additionality can drive corporate buyers to accept higher risk PPA arrangements (e.g., longer tenor) to secure a greenfield project.

- **Sophistication and forward price expectations**

Corporate buyers with teams focused on electricity purchasing (and their advisors) may have forward price expectations. This may drive corporate buyers to pursue PPAs and/or non-fixed-price structures. All else being equal, upward price expectations typically drive demand for fixed-price structures, while downward price expectations drive demand for floating structures

- **Risk aversion**

A risk management strategy may drive demand for shorter PPAs or floating structures; conversely it may drive other buyers to seek to lock in longer term wholesale prices

6. METERING

- Ownership of Metering Devices
- Testing and Inspection of Metering Equipment
- Measurement of Net Energy Output
- All electric metering associated with the Project including the Project Meter, whether owned by Seller or a third party, shall be installed, operated, maintained, and tested by or on behalf of Seller in accordance with existing practices and standards as well as Good Utility Practices, and any applicable Purchaser technical requirements.

- The Seller shall install, maintain, operate, test and replace (as appropriate) the Project Meter, telemetry equipment, and other appropriate electric meters and back-up meters at its sole cost and expense to accurately determine Delivered Energy taken by Purchaser under the Agreement or otherwise delivered by the Project.
- If the physical location of the Project Meter is not at the Point of Receipt, then, in conformance with applicable rules and Good Utility Practice, revenue quality loss compensation metering shall be used to account for any transmission or transformer losses between the Project Meter and the Point of Delivery

- The electric meters shall be checked annually by Seller who shall provide Purchaser with not less than thirty (30) days prior written Notice of such tests.
- Purchaser shall have the right to have a representative(s) present during such tests.
- Seller shall be responsible for fully metering all Project Energy generation, including the obligation to accurately and completely send meter telemetry if any.

- Seller shall exercise reasonable care in the maintenance and operation of such metering equipment so as to assure to the maximum extent practicable an accurate determination of such quantities of Energy and Products.
- The amount of Energy measured by the Project Meter as being delivered to the Delivery Point rounded downward to the nearest MWh shall be the basis for determining Delivered Energy and the amount of other Products delivered pursuant to this Agreement based on such Delivered Energy, subject to Purchaser's testing and audit rights.

- Either Party may from time to time request a retest of the meters if it reasonably believes that the meters are not accurate within the established tolerance limits.
- The requesting Party shall pay for any such retest and shall provide the other Party with not less than fourteen (14) days prior written Notice of such retest.
- The specific telemetry data points required for the Project, as measured by the Project Meter, are: MW, MVAR, MWH, MVARH, isolation breaker open/closed status, interconnection bus voltage, and amp flow, enabling Seller to provide real-time dynamic signals to Purchaser regarding the types and amounts of Products that are to be delivered pursuant to RPPA and enabling Seller to provide Purchaser real-time dynamic signals specifying the amount of Delivered Energy that is being delivered to the Delivery Point at all time

7. DEFAULTS AND TERMINATION

- RPPAs often address milestones to be met to reach commercial operation. Construction or development milestones are intended to allow the Purchaser and Seller to track the project's development progress.
- The RPPA may identify a variety of milestones, including: acquisition of all permits needed for construction; execution of a construction contract; commencement of construction; evidence of the Seller's purchase of RE facilities; and, ultimately, commercial operation.

- If the RPPA addresses milestones, typically the Seller must meet the dates established in the RPPA for each of the milestones or risk paying delay damages.
- Usually delay damages are often calculated by multiplying a currency amount by the number of MWs of contracted capacity or the contracted electric power output, for each day the Seller fails to meet a milestone.
- Failure to meet the construction milestone for commercial operations may also trigger penalties per day per MW or MWh of contracted energy output.
- The RPPA may also include a provision that allows the Seller to recover any delay damages paid to the Purchaser for earlier missed milestones if the Seller is able to deliver the project by the milestone for commercial operation.
- RPPAs include detailed sections related to events of default.

- Many events of default are curable, which means there is an opportunity to resolve the issue.
- When negotiating a RPPA, the parties acknowledge that there may be circumstances beyond the parties' control that could prevent them from performing under the RPPA, that is, for events of "force majeure." If a force majeure event occurs, the agreement will excuse both parties from responsibility and liability related to any delay or failure to perform.
- Most agreements will require that the party asserting force majeure to provide the other party with notice. Often, Sellers and Purchasers negotiate over how broadly or narrowly to define what constitutes force majeure.

- When an event of default occurs and remains uncured, the non-defaulting party may be entitled to actual damages and/or the right to terminate the RPPA.
- If the Seller defaults, this will usually mean the Purchaser can recover costs for purchasing replacement energy in addition to any other costs incurred. Liability for damages due to a delay or event of default are often capped, and Sellers and Purchasers negotiate over that the appropriate caps should be in different situations.
- The liability cap for delay damages may be substantially less than the cap for overall damages following an event of default.

6-Key Considerations for Negotiation

Volume & Period

- The most important considerations in any RPPA negotiation are the volume of generation output purchased and the term of the contract. Every buyer has different procurement objectives and every RPPA is different, with terms negotiated between projects and individual off-takers
- The volume of electricity purchased is often fixed, based on the requirements of the buyer and a project's need for a predictable revenue stream to underpin financing.
- Prices can be fixed for shorter terms (5 Years) and renegotiated later, or set at a longer fixed term (20 Years)

Pricing

- Along with providing a straightforward route to renewable energy procurement, RPPA's are also used as a hedge against future price rises. Determining the RPPA pricing structure, and the calculations underlying it, is a crucial step.
- Contracts typically specify the rate (Rs/kWh) a buyer will pay a developer for the project's output. It often includes a fixed price along with an escalator enabling the RPPA price to increase over time but at a controlled rate of growth, generally less than inflation rate-3 percent.
- The buyer may buy the electricity at a negotiated price linked with the wholesale market.

Country Specifics

- Understanding the renewables growth rate for the countries where settlement takes place (and referencing it in a RPPA) provides important context, helping energy buyers understand the volume of clean power currently on a national grid and how much is projected to be there in the future.
- Changes in the volume of power generated by renewables can impact energy prices and affect the value of a company's investment in a particular project.

Project Risks

Knowing the level of risk attached to development is essential for determining which investments are most likely to be seen through to completion.

- Poor risk assessment and risk allocation early on in the concept and design phase of a project can have knock-on effects that lead to higher risks later on.
- With data and analytics, projects can be risk-scored by factoring in and weighting uncertainties related to site control, permit applications, financing, interconnection, and regulatory compliance, any of which could derail a project's timeline or stop construction.
- The risk score calculated could well point to a high likelihood of project failure or significant delay, even where the projected long-term value is positive.
- Scoring development risk at the outset can help identify projects with a risk level you are comfortable with, avoiding those likely to suffer delays.

Price Volatility

- To address the level of price volatility attached to projects that are already operational, buyers should consider its pattern of historical price fluctuations.
- Tracking recent swings in a renewable project's settlement price (the difference between profit and loss on a typical day) clarifies how it's performed in the past, and how it's likely to perform in the future.
- That enables corporates to negotiate pricing and terms based on data-driven projections of future price swings.

Consumption Pattern

- The energy usage patterns and volume needs of individual organisations are distinct from one company to another. Each has a unique consumption profile that impacts their energy load and the shape of the renewable generation needed to match their requirements.
- Understanding the level of correlation between the profile of a potential corporate buyer and the shape of a project's generation and is essential if the buyer's energy needs are going to be met.
- Wind projects are quite variable source of renewable power and tend to generate most of their power during the night. Large retail chains draw most of their energy during daylight hours, so relying on wind alone would be a poor fit.
- Building a diversified renewable energy portfolio that combines different projects and technologies would provide a better match between a retailer's consumption profile and the shape of generation.

Additional Points to be negotiated

- A key issue of discussion in a RPPA is the pricing.
- Pricing will ensure the cash flows and allows a forecast of the revenue over the lifetime of the project.
- In past pricing has been at a flat rate but now emerging trend with renewable energy is bids, the buyer and seller making an investment in the power project while participating in Auction, should see all such variables.
- Any change in law can also be covered by using pass-through elements, to make the project viable and profitable.
- Commissioning dates are also important to know before signing.

- Other Terms should also be examined like project milestones, implementation schedule and commercial operation date of the power project. A seriously studied project can only be survived.
- The advantage with renewable energy projects is that capacity of the contract can be staggered. Additional wind turbines or solar panels can be added subsequently making the commercial operation date easier to achieve.
- Key milestones and longstop dates for certain conditions including penalties for delays would require particular attention.
- To connect to the grid and the need for interconnection facilities, would also be examined with reference to ground realities

- Any constraints of the transmission system which may result in the purchaser curtailing the supply of power to the grid may also studied and discussed. One should decide, that who will bear the costs of such curtailment.
- Technology of Wind and Solar and its performance parameters also to be seen while negotiating a RPPA.
- An Early Termination, which allow any party to the RPPA to terminate can be discussed and events of defaults are important issues, one should carefully decide them.
- For example, One such event can be non financing of the project or part finance and Purchaser can early terminate the RPPA. Therefore such conditions are to be examined in detail with legal Person.

Risk of Re-negotiation

- In past when there was FIT, Solar and wind energy developers signed contracts with a power purchaser i.e distribution companies for a prescribed period (typically 25 years) at a particular tariff rate per unit, which was based on the capital cost, land costs as well as other operations and maintenance (O&M) costs for the supply of all the generated power at that point of time.
- Due to advancements in technologies, the price of equipment is decreasing fast. Therefore, the cost of overall projects are decreasing at a fast pace, resulting in a more competitive market and cheaper tariff rates. The lowest tariffs for solar was at Rs 2.44 per unit and wind at Rs 2.43 in 2017 respectively.
- This happened due to competitive bids and falling prices and changing policies.
- Any previously done RPPA on higher price if renegotiated it may affect the viability of the project.

Way Forward

- **Financial:** RPPAs provide a hedge against future energy fluctuations
- **Environmental:** RPPAs put clean energy into the electric grid, and the buyer owns all the environmental benefits (RECs or carbon offsets) associated with its portion of the project.
- **Ability to Transact:** Although RPPAs are complex, they are well-understood structures. Some form of physical RPPAs may even be part of an buyer existing procurement practices.

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On-line Training of SAARC Professionals on Power Purchase Agreements of Renewable Energy Projects

Thank you