

***Executive's Checklist for:
Power Purchase Agreements ("PPAs") & Virtual PPAs ("VPPAs")***

What is a "Sleeved" PPA?

A sleeved PPA is a tripartite contract structure frequently utilized by organizations to acquire renewable electricity and to meet their sustainability energy goals. The involved parties include: i) the customer (energy consumer), ii) a renewable energy project, and iii) an electricity supplier or certified energy retailer.

To directly sell renewable energy to customers, a renewable energy developer would be required to register as a utility. This is a costly and cumbersome hurdle to achieve. So instead, they sell the electricity through the wholesale market using a certified energy retailer. The energy retailer sells the contracted electrons to the customer for a fee and the right to sell excess energy demanded to the customer at the prevailing market price through a retail supply contract. PPAs allow customers to receive green, sustainable energy for operational use with no upfront capital required while also guaranteeing electricity price stability for the length of the contract.

Advantages of a Sleeved PPA:

There are many benefits of a sleeved PPA. In addition to achieving sustainability, a key advantage is the ability for the customer to fix its price for energy, instead of being subject to utility tariff rates influenced by supply and demand. Because PPAs are usually between 10 to 25 years in length, PPAs attain price certainty for the length of the contract. Another benefit relates to "additionality:" the PPA contributes to the financing of renewable energy projects, so by signing a PPA, customers can advertise that they contributed to additional demand for renewable electricity.

- ***Sustainability***
- ***No upfront CAPEX required***
- ***Provides hedge against electricity price volatility***
- ***Creates predictability***
- ***Supports energy transition to cleaner generation***

Disadvantages of a Sleeved PPA:

Although there are many advantages, sleeved PPAs have some key disadvantages. One of the biggest disadvantages is the intermittency of renewable output. For instance, a sleeved PPA for solar or wind energy can only supply power when the sun is shining, or the wind is blowing. Therefore,

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customers seeking to avoid consuming “dirty energy” must sign sufficient PPAs with alternative renewable energy generators to cover all the hours when the customer is consuming power, or to contract for Renewable Energy Certificates (“RECs”) or energy attribute certificates (“EACs”) sufficient to cover the entirety of a customer’s consumption.

Another downside to sleeved PPAs is that it is generally more difficult and more expensive to contract for small quantities of energy from large renewable energy projects. For customers consuming less than a few megawatts per day, typically it will be more expensive to find a supplier.

- **Intermittency concerns:**
 - ***For organizations requiring 24/7 power, multiple contracts are typically required to hedge against the intermittency of renewable energy output.***
 - ***Also, smaller customers may be required to pay market prices for energy and market prices for RECs to achieve a sustainable solution.***
- ***Smaller quantities of energy are typically more expensive than larger supply contracts.***
- ***Often requires two contracts: one PPA with the renewable energy project and a retail supply contract with the certified energy supplier/retailer.***
- ***The certified energy supplier/retailer may charge a “sleeving” fee for participating in the agreement.***

Despite the downsides, a sleeved PPA can still be a good means to achieving a customer’s sustainability objectives. The following checklist/guide details the thought process and procedures for executing a sleeved PPA.

Checklist:

1. **Determine local/state regulations that apply to PPAs.** If your business is not located within a jurisdiction with a competitive electricity market, a PPA may be unavailable.
2. **Determine Energy Usage Requirements and Renewable Energy Usage Goals**
 - a. What percentage of your load do you wish to contract renewable energy for?
 - b. Collect utility billing data
 - c. Collect utility interval data
 - d. Analyze load shape
 - i. How does it change by the:
 1. Day?
 2. Week?
 3. Month?
 4. Year?
 - e. It is recommended that you hire a professional electrical engineer to aid in determining your energy needs and to ensure the accuracy of the analysis.

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3. **Locate and establish communications with a renewable energy project located within your Regional Transmission Organization (RTO).**
 - a. How does the project generate renewable electricity?
 - b. How much electricity is the project capable of /willing to supply?
 - c. How old is the facility?
4. **Hire legal representation to negotiate a Power Purchase Agreement (PPA).**
 - a. Come to an agreement with the supplier on a price per MWh / kWh.
 - b. Come to an agreement on the quantity of electricity to be supplied (as a % of your load).
 - c. Come to an agreement on the duration/term of the PPA.
5. **Reach out and establish communications with an electricity retailer or certified electricity supplier.**
6. **Negotiate with certified electricity retailer/supplier**
 - a. Determine the sleeving fee.
7. **Sign retail supply contract with (certified) electricity retailer for any excess electricity demand.**
8. **Continue to service both contracts.**

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What is a “Virtual (Synthetic) PPA”?

A virtual PPA (“VPPA”), sometimes called a financial PPA, is a financial mechanism used to provide customers with renewable energy credits (RECs) used to reduce scope 2 emissions while also helping to hedge against wholesale electricity market volatility. A VPPA does not include the direct supply of renewable electricity, hence it is virtual as opposed to “physical”.

Typically, an organization signs a PPA with a renewable energy project or developer for the RECs corresponding to a specific amount of electricity generated the project. The customer then retires the contracted RECs to reduce their scope 2 emissions. In addition, the contract includes a financial settlement for differences determined by a specified fixed price for the electricity (labeled the “strike price”).

Because the contract is purely financial, the customer must continue to purchase electricity from their current energy provider at the current rate through a physical electricity supply agreement. The renewable electricity supplier then sells the electricity generated into the wholesale electricity market while transferring the RECs directly to the customer.

Because both parties face market price volatility in the wholesale and retail electricity markets, the strike price is used as a hedging mechanism. If the market price of electricity is greater than the strike price, the renewable energy project pays the difference to the customer. If the strike price is greater than the market price of electricity, the customer pays the renewable energy project the difference. In this way, the VPPA allows both the customer and the project developer to hedge against energy market price volatility, while the customer receives RECs certifying their consumption of renewable energy and reducing their scope 2 emissions.

Advantages of a VPPA:

- *Sustainability:*
 - *Allows an organization to contract for RECs corresponding to 100% of its electricity needs.*
- *Flexibility*
 - *Customer can choose the percentage of load they wish to purchase RECs for*
- *No upfront capex required*
- *Hedges against market price volatility*

Disadvantages of a VPPA:

- *Does not provide the same price predictability as a physical, sleeved PPA*
- *Intermittency Concerns*
- *If your organization requires 24/7 power and the contracted project does not generate power 24/7, you will be required to:*
 - *Purchase additional RECs at market price, or*

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- *Contract for more electricity during the day to obtain sufficient RECs corresponding to your 24/7 load, or*
- *Establish multiple VPPAs for electricity generated by various methods in various locations to hedge against the intermittency of renewables*
- *Relatively complex and requires market expertise to achieve best terms*

Checklist for a VPPA:

1. **Determine local/state regulations that apply to power purchase agreements.** If your business is not located within a jurisdiction with a competitive electricity market, a VPPA may be off the table.
2. **Determine whether RECs can be used in your region to reduce scope 2 emissions**
3. **Determine Energy Usage Requirements and Renewable Energy Usage Goals**
 - a. What percentage of your load do you wish to contract renewable energy for?
 - b. Collect utility billing data
 - c. Collect utility interval data
 - d. Analyze load shape
 - i. How does it change by the:
 1. Day?
 2. Week?
 3. Month?
 4. Year?
 - e. It is recommended that you hire a professional electrical engineer to aid in determining your energy needs and to ensure the accuracy of the analysis
4. **Locate and establish communications with a renewable energy project located within your Regional Transmission Organization (RTO)**
 - a. How does the project generate renewable electricity?
 - b. How much electricity is the project capable of/willing to supply?
 - c. Does the project generate RECs?
 - d. How old is the facility?
5. **Hire legal representation to facilitate contracting process**
6. **Negotiate the quantity of electricity to be covered by the PPA**
7. **Negotiate the financial settlement for difference**
 - a. Determine the strike price
 - b. It is recommended that you hire an electricity market expert to aid in the negotiating process to ensure the best terms
8. **Continue to service your current physical electricity supply contract**
9. **Service VPPA**
10. **Retire RECs to reduce scope 2 emissions**

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