

A photograph of a wind turbine against a sunset sky with orange and purple hues. The turbine is white and has three blades. The nacelle has 'EDISON' and 'CW88' written on it. The background shows a silhouette of a mountain range.

ARTICLE

Renewable energy power purchase agreements

Viable procurement options for corporate and industrial buyers

As we discussed in the [first article](#) of this series, today's renewable energy landscape has dramatically changed in recent years in large part because of the increasing pool of potential buyers – commercial and industrial (C&I) organizations. This new buyer pool has wider, easier access to a broad array of large-scale direct renewable energy procurement options and is implementing on-site solar and off-site PPAs at a record-breaking pace. But deciding which option is right for your organization can be complex. This series helps lay the foundation to answer that conundrum. In the first article, we covered the benefits and

challenges to C&I customers looking to use on-site renewable generation. This article will explore the potential of procuring renewable energy through power purchase agreements (PPAs), both physical and financial (defined below). Both types of PPAs can be powerful tools to help C&I customers develop robust clean energy portfolios and achieve sustainability goals. However, they do differ in a number of significant ways, and this article identifies these differences and other factors to consider when evaluating PPA opportunities.

WHAT IS A PPA?

A power purchase agreement, at its core, is a contract between two parties where one party sells both electricity and renewable energy certificates (RECs) to another party. In corporate renewable energy PPAs, the “seller” is often the developer or project owner, the “buyer” (often called the “offtaker”) is the C&I entity. C&I renewable energy PPAs can take two primary forms – physical or financial (the latter often referred to as “virtual”). The best structure depends on the markets where the offtaker and projects are located, as well as the goals, priorities, and risk tolerance of the offtaker. Too often, these deals are framed as money-makers, but the real story is much more complicated. This [related article](#) dives deeper into the risks embedded in renewable energy PPAs and how to mitigate them.

Physical PPA

Physical PPAs are most commonly used by organizations that have heavy, concentrated load (e.g. data centers). This is because under a physical PPA, the seller delivers renewable electricity to the offtaker, who actually receives and takes legal title to the energy. Physical PPAs are best suited for competitive retail or direct access energy markets, such as Texas, Illinois, and California. They are possible – but significantly more difficult – in a regulated market. A physical PPA is structured as follows:

- + The offtaker 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 offtaker takes title to the energy at the delivery point, as well as associated RECs.
- + The offtaker is responsible for moving the energy away from the delivery point to its load, typically done through 3rd-party service providers.

Virtual (or Financial) PPA

Unlike a physical PPA, a virtual PPA (VPPA) is a financial contract rather than a contract for power. The offtaker does not receive, or take legal title to, the electricity and in this way, it is a “virtual” power purchase agreement.

In a VPPA, an offtaker 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 offtaker. More specifically:

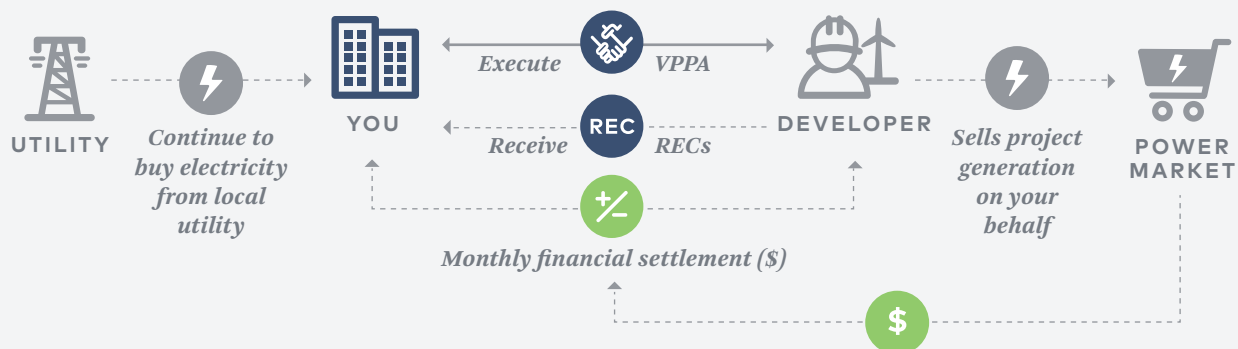
- + Similar to a physical PPA, the seller in a VPPA is oftentimes a developer who builds, owns, and operates a project and delivers the energy output to the specified point.
- + The offtaker agrees to pay the seller a fixed price for renewable energy delivered to a specific point, typically a market 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 offtaker. When the converse is true, the market price is below the VPPA fixed price, the offtaker must pay the developer the difference.
- + The offtaker retains all of the RECs associated with the delivered energy, as long as that is specified in the contract.

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This type of structure is called a contract for difference (CFD). See the graphic below for an illustration.

HOW DOES A VPPA WORK?

With a VPPA, you are receiving the renewable energy certificates (RECs) generated by the project, which you can use to reduce your scope 2 emissions. The nature of this contract results in no change to your current electricity bill – you keep buying electricity from your utility or retail provider.



In this way, the seller is guaranteed a fixed price for the output it sells – which is critical for developers that are looking to finance new projects. These projects can be particularly attractive for buyers that want to contribute to the development of new renewable energy resources and that have electricity load that is widely dispersed.

VPPAs are typically only available in organized markets such as a regional transmission organization (RTO) or independent system operator (ISO), which serve as third-party independent operators of the transmission system, ultimately responsible for the flow of electricity within its domain. This is for two important reasons. First, VPPAs require market liquidity – where the developer, an independent power producer (IPP), is permitted to sell its power directly into the grid. This is the case in RTO/ISO regions, but not necessarily so in a vertically integrated market where a single entity is responsible for the generation, transmission, and distribution of electricity. Second, the economics of a VPPA hinge on the difference between the floating market price and the VPPA price. RTO/ISO regions pay a uniform, transparent price (varying based on time and location). The floating market price, therefore, cannot be manipulated by the developer, creating a reliable dynamic for the VPPA financial settlement.

Importantly, because no energy actually changes hands, the VPPA offtaker does not need to make any changes to how it purchases the electricity required for its operations.

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WHY ENTER A PPA?

There are four primary benefits to a PPA, regardless of whether it is physical or financial:



Financial

PPAs provide a hedge against future energy fluctuations. In a physical PPA, the hedge value is realized because the buyer's energy costs are kept flat. In a VPPA, the value is realized when revenues from the VPPA increase because market pricing has risen above the PPA price – offsetting similarly rising retail electric rates. It's important to remember though, a hedge instrument is not intended to create upside but rather to manage downside exposure. Be wary of VPPAs with hockey stick forward energy price curves promising high net present values (NPVs)!

PPAs have financial, environmental, transaction, and marketing benefits.



Environmental

Both physical and virtual PPAs put clean energy into the electric grid, and the offtaker owns all the environmental benefits (RECs or carbon offsets) associated with its portion of the project. Both types of PPA RECs from wind or solar will have zero emissions and apply to WRI's GHG Protocol Scope 2 market-based reporting methodology. And, if the PPA is with a new project, offtakers can easily and credibly claim "additionality" which, in its mostly widely-accepted definition, means directly causing a new renewable project to be built.



Ability to Transact

Although PPAs are complex, they are well-understood structures. Some form of physical PPAs may even be part of an offtaker's existing procurement practices. In addition, awareness of renewable energy PPAs has become more common through high-profile press releases by well-known companies (e.g., Google, Walmart, Amazon, etc.). All of this should facilitate internal stakeholder conversations and ultimately leadership buy-in. While VPPAs may face more scrutiny than their physical brethren – due to unfamiliarity as well as their potential accounting impacts (see below) – these barriers are surmountable.



Marketing

PPAs are a well-understood renewable energy story to share with internal and external stakeholders. They also move the needle on a double bottom line – helping to achieve important corporate environmental goals while also (potentially) saving money, which makes for powerful brand and marketing narratives. And because the offtaker owns the RECs, it can make marketing claims and report on greenhouse gas reductions.

PHYSICAL VS. VIRTUAL

Despite these shared benefits, physical and virtual PPAs do differ in some material ways:

- + **Regulatory:** Physical PPAs require that the offtaker obtain power marketing authority from the Federal Energy Regulatory Commission (FERC) to purchase wholesale power from the power producer. While not insurmountable, doing so may be outside of the offtaker's core business or simply be too time-consuming. An offtaker can engage a third party already authorized to buy power at wholesale, serving as the market participant. This, of course, has its own risks (see below). Because no power is changing hands in a VPPA, the offtaker does not require FERC authority.
- + **Regulatory (again):** Although the regulatory requirements for VPPAs are still being formed, the prevailing view is that these contracts are "swap" agreements and therefore bound by Dodd-Frank Wall Street Reform and Consumer Protection Act ("Dodd-Frank"), which includes reporting, recordkeeping and registration requirements for swap transactions. Physical PPAs are not typically considered swaps subject to Dodd-Frank. However, if a physical PPA contains specific terms (e.g., price optionality, buyer curtailment rights, option for financial settlement), it may in fact be deemed a swap and subject to ongoing reporting obligations. See [this article](#) for more.
- + **Transmission/Delivery:** Physical PPA offtakers need to consider what happens with the energy once they receive and take title to it and find a solution to move the purchased energy to its locations, requiring transmission, distribution, and delivery. C&I offtakers would typically contract with third party providers for these services, and perfectly syncing the deal terms of these services (typically limited to a couple to several years) with those of longer-term PPAs is unlikely and can add a compounding layer of risk and complexity to the overall transaction.
- + **Location:** As mentioned above, physical deal structures where the energy is delivered to an offtaker's facility are limited to competitive retail markets (i.e., PJM, Northeast, ERCOT and other isolated states in MISO and WECC). Virtual PPAs have broader potential, possible in any RTO or ISO. Further, because VPPAs are financial in nature and don't involve moving electricity, they are not inherently location-dependent. This means offtakers can find the most attractive project, no longer limited to projects located within its immediate region. It also allows offtakers to consolidate its demand across the country to capture economies of scale.
- + **Internal Approvals:** PPAs will require learning on multiple levels for an organization, but VPPAs tend to be a new procurement mechanism for most offtakers, requiring education on technical and non-technical topics alike. Not to be under-estimated, VPPAs require new departmental interdependencies within organizations, which can have cascading affects across the company. Processes will need to be developed, building a new ecosystem of collaboration among otherwise distant and unfamiliar stakeholders. All this takes time, effort, and persistence.

PPAs and VPPAs have important regulatory differences.

Each of these factors should be considered when evaluating PPA opportunities.

RISKY BUSINESS?

Although PPAs are increasingly common among the C&I segment, they are not risk-free. There will be tradeoffs in every deal structure, and special attention should be paid to the following risks and potential mitigation measures.



Market risk

Although offtakers have market exposure without a PPA, there is market risk within these transactions, especially VPPAs. Because a VPPA relies on a floating market price, the importance of understanding the forces which can affect that floating price – and drive it up or down – can't be overstated. Factors that can impact future electricity pricing include renewable energy penetration, natural gas pricing, transmission and distribution upgrades, energy capacity additions and retirements (renewable and conventional), the regulatory environment, carbon pricing, severe weather occurrences, etc. Offtakers should have clear visibility into the market risks embedded in the transaction so they can make informed decisions about what risks they are, and are not, willing to take, ultimately structuring a transaction in line with their specific risk tolerance.



Accounting treatment

For many C&I offtakers, the accounting treatment of a VPPA is the first make-or-break decision regarding a potential transaction. In many cases, the offtaker will obtain initial approval to explore offtake renewables only if they can keep the PPA off of the balance sheet. They ask, will the deal trigger mark-to-market accounting? Fortunately, there are well understood ways to manage this risk through careful deal structuring and specific PPA language. For example, one way for an offtaker to manage a developer's performance is to include an output guarantee – a minimum amount of generation the developer will deliver. However, an output guarantee is considered a notional value to the contract, thus triggering derivative accounting. As a result, contracts are often structured with an availability guarantee which accomplishes similar assurances of developer performance but avoids the risk related to accounting treatment of the VPPA. The bottom line here is that VPPAs will require the deal champion – and an advisor – to work extensively with your organization's various accounting stakeholders and an experienced energy accountant.

THE IMPORTANCE OF A TRUSTED ADVISOR

Both physical and virtual PPAs offer strong financial and environmental opportunities to C&I organizations, but they can come with material complexity and risk. VPPAs are most common in today's market but they are not right for every organization. We recommend working closely with a trusted advisor to determine which option is best for your organization.