

# WHAT YOU SHOULD KNOW ABOUT VIRTUAL POWER PURCHASE AGREEMENTS



By allowing you to invest in renewable projects anywhere in the country, Virtual Power Purchase Agreements give you access to the benefits of locations that can support larger, higher performance projects, or have more favorable legislation.

## CONTRACTS FOR DIFFERENCES - THE KEY TO UNDERSTANDING VPPAS



In order to understand how Virtual Power Purchase Agreements (VPPA) work, it is essential to first understand a financial model called a **Contract for Differences (CFD)**. A CFD is an arrangement that allows a party to get a fixed price for a good or service that is usually sold at a variable rate.

### A SIMPLE EXAMPLE...

At a local market, the price for apples changes every day as supply is more or less plentiful. An apple seller wants to buy a new orchard, but needs a steady price for future apple sales in order to assure that she can pay for the investment. A local pie maker is also looking to keep the price he pays for apples consistent, a **Contract for Differences** with the apple seller.

**It starts with a fixed rate** The apple seller can afford to buy the orchard if she's guaranteed to get 5¢ an apple for the next 10 years. **The apple seller and the pie maker both still sell or buy their apples at the same market**, but when

the seller makes more than 5¢ per apple, she gives the overage to the pie maker. If the apple seller gets less than 5¢ per apple, the pie maker makes up the difference.

**If the apple seller makes 7¢ per apple...** she owes the pie maker 2¢ per apple. This way, the apple seller gets her 5¢ an apple, and the pie maker (who paid 7¢ at the market) gets that 2¢ back, effectively paying 5¢ per apple.

**If the apple seller only gets 3¢ per apple...** the pie maker (who bought his apples at the market for 3¢) makes up the difference – paying the apple seller 2¢ per apple. The apple seller is always guaranteed her 5¢, and the pie maker pays the same consistent 5¢ per apple.

### Location is important!

If the pie maker moves to another town during his 10 year contract with the apple seller, the deal still stands, but now he buys his apples in a different market at a different price than the apple seller is getting for her apples.

**If the apple seller makes 7¢ per apple...** the pie maker gets that 2¢ back, but depending the price that he paid at his new market, he could stand to pay less than 5¢ per apple, or even make a profit if he paid less than 2¢.

**If the apple seller only gets 3¢ per apple one day...** the pie maker still owes the apple seller 2¢ per apple, but if the price in his new market is more than 3¢ per apple, he could potentially pay more than 5¢ per apple.

### HOW DO CFDS APPLY TO ENERGY?

A CFD for electricity is called a Virtual Power Purchase agreement, or VPPA. Often, these terms are used interchangably. In many ways VPPAs work exactly the same way as our simplified CFD example above.

In a VPPA, an organization (pie maker) enters into a long term agreement with an electricity generator (apple vendor) for a fixed electricity (apple) price. The variable price (market price) that the agreement is set against comes from the **spot market** (check out the callout box on the right). At the end of each month, the organization receives a reconciliation from the generator and either gets a payment or an invoice for the amount owed if the market price was higher or lower than their contracted rate.

**BUT...** The VPPA transaction is a financial one – there is no physical delivery of the actual electricity generated. The organization must still continue to purchase electricity from the competitive market or from utility default service.

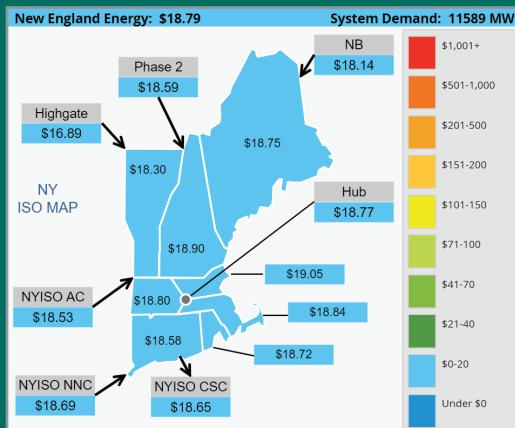
## SPOT MARKET BASICS

**SPOT MARKET** Electricity is sold/traded between generators and load serving entities on an hourly basis. This is called the **spot market**. The “**spot price**” is the price of electricity at any given hour.

**KNOW YOUR REGION** The US is broken up into regions, each with its own inter-state electrical grid. New England is its own region, and the majority of the electricity that New England end users consume is generated and transmitted within the six New England states. This region defines how the market operates and sets prices.

**LMP** stands for **Locational Marginal Price**. Spot prices for electricity vary depending on location. The New England region is broken up into over 1,000 **nodes**, each with their own hourly electricity price. These nodes are also consolidated into **hubs**, shown in the diagram below. These prices can be affected by things like weather, local demand, or transmission line congestion.

### AN EXAMPLE OF RECENT NEW ENGLAND HUB SPOT PRICING



# CES UNIVERSITY CONTRACT FOR DIFFERENCES

## SO WHAT IS THE POINT OF A VPPA?

To understand what makes VPPAs so desirable right now for some large consumers, it is important first to understand a few things about how renewable energy is purchased in the US. Specifically, the renewable attributes market - or Renewable Energy Credits.

## WHAT IS A RENEWABLE ENERGY CREDIT?

When energy is generated using renewable sources (like wind and solar), it often gets broken up into two conceptual pieces: the physical electricity that is delivered to the grid and "environmental attributes," which are the environmental benefits of generating power using renewable energy. These environmental attributes are called Renewable Energy Credits, or RECs, and can be sold either together (usually referred to as bundled) or separately (unbundled) from the physical power that gets put on the grid.

Today, many organizations want to make a commitment to using renewable energy, but very few are able to generate enough power with onsite renewable projects to meet all of their energy needs. Most electricity users are at the mercy of the mix of electricity sources coming from their regional power grid. Only about 19% of electricity in New England was generated from renewable sources in 2018.



The way that many of these organizations meet their sustainability goals is by purchasing unbundled or bundled RECs directly from renewable energy generators. By buying RECs, organizations can offset any emissions created by the electricity they purchase from their regional grid.

## WHAT DO RECs HAVE TO DO WITH VPPAs?

Buying unbundled RECs from operating generators is an easy thing that anyone can do to support existing facilities and guarantee that they can keep putting renewably produced electrons onto the grid, but **purchasing RECs via a VPPA comes with a number of significant differences:**

### 1 VPPAs CAN SUPPORT NEW GENERATION

When a renewable developer is planning a new project, they can pre-sell the energy they will produce via a long-term VPPA which will allow them to more easily obtain financing and get their project built. Without new construction, that 19% renewable power in the annual New England fuel mix will never improve. **By supporting new renewables projects through VPPAs, offtakers are more actively contributing to additionality - or the creation of new renewable energy being added to the grid.**

### 2 VPPAs ARE AN OPPORTUNITY FOR COST SAVINGS (but also risk and long term commitment)

In a VPPA with a renewable developer, the purchaser, or **ofttaker**, signs a long-term (usually 10-20 years) agreement to purchase all of the bundled energy and RECs from the project at a fixed rate once the project is operational. The offtaker retains the RECs, but because no physical electricity is delivered through the VPPA, the developer sells it hourly on the spot market.

$$\text{FIXED RATE} - \text{SPOT PRICE (LMP)} = \text{COST OF RECS}$$

Like in our example, if the LMP price is lower than the contract rate, then the offtaker makes up the difference. If it is higher, the developer will pay the offtaker the difference. Depending on the region, **spot prices can at times go negative**, which would cause the offtaker to pay much more than the fixed rate per kWh to the developer. Spot price volatility can be a big risk, but if the offtaker thoroughly researches the project and the region, they could end up with a long-term source of low cost RECs - or even get paid to take them.

### 3 VPPAs ALLOW OUT-OF-REGION PARTICIPATION

Although there can be some advantages to investing in projects locally, offtakers in New England will find that long snowy winters and limited land resources make projects in the region that cost more and produce less than other parts of the US. VPPAs open the door for offtakers to invest directly in projects in areas like Texas and the Midwest, where they will be getting the lowest VPPA rate - and be supporting renewable generation in regions with higher emissions.

### 4 VPPAs MEAN REC FLEXIBILITY

Under a VPPA, if all of the RECs produced under the agreement belong to the offtaker, so they can retire the ones they need and sell the rest to others.

## WHO CAN PARTICIPATE IN VPPAs?

**VPPAs are all about SCALE.** Larger projects make more economic sense for developers, which means a huge initial financial investment. It's advantageous for the developers - and the banks that lend to them - to enter into as few VPPAs as possible to help fund their project. Public or private businesses and organizations that are good candidates to seek a VPPA agreement with a renewable developer are big, eco-conscious energy users who want to buy a large amount of RECs to offset their grid use. These are also entities that have good enough credit to be able to guarantee continued payment over the course of their 10-20 year contract. However, if you're not super-sized, there could still be opportunities for participation with a group or consortium of credit-worthy businesses or organizations who want to get in on the VPPA action.

## THE BOTTOM LINE

If you've got the goods to participate and do your homework to find the right project, VPPAs can be a win-win for all parties. They allow new renewables projects to be financed, adding new, green generation to the grid, and giving offtakers the RECs they need to meet their sustainability goals - sometimes at a very low rate that might even generate some income over the life of the contract.