The Economic Case for Renewable Energy

WHY COMPANIES ARE CHOOSING POWER PURCHASE AGREEMENTS
In 2006, Whole Foods Market made history when it became the first large-scale, U.S.-based corporation to make a commitment to purchase 100% renewable energy for its North American retail operations. At the time, there were only a few early adopters of clean energy in the commercial, industrial, and institutional (C&I) space, making the Whole Foods commitment noteworthy. To achieve its goal, Whole Foods relied on renewable energy certificates (RECs), which remain the way that green power is tracked and traded today. The company was willing to buy those RECs at a premium price because doing so aligned with its environmental goals.

Fast forward a decade.

Today, thousands of companies throughout the world are using green power in their operations. Many still do so because of their environmental commitments. But, in more than 30 countries, renewable energy has reached price parity with fossil fuels, a game-changing turn of events. For instance, in December, Bloomberg reported that prices in some developing markets, such as the Middle East, now make solar the cheapest available source of energy.

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Understanding Power Purchase Agreements

PPAs are nothing new. They’ve been in use for years between developers and utilities who, until recently, were typically the largest contractors for renewable energy supply. However, beginning in 2008, private sector institutions began considering PPAs as a means to work directly with renewable energy developers in order to address their own energy needs. In 2010, Google signed the first of their PPAs. To date, the company has executed more than 20 global clean energy projects, allowing them to operate on 100% green power in 2017 as the world’s largest corporate purchaser of renewable energy.³

Between 2010 and 2016, C&I buyers executed more than 7,000 MW of wind and solar PPAs in the U.S., helping to drive the dramatic increase in that market. These buyers are also expanding the reach of their energy management programs, signing offsite and onsite PPA deals in regions including Mexico, Sweden, the Netherlands, China, Chile, Ireland, Norway, Scotland, and India.

In certain markets, PPAs are the way a buyer can contract direction with a power generation for their electricity. PPAs can take two forms: retail PPAs, where the power is delivered and accounted for on the buyer’s electricity bill, and financial PPAs, structured as a contract for differences. The buyer—in this case, an organization—contracts directly with the supplier—a wind or solar farm—at a fixed-price for power. At regular intervals, the difference between the contracted fixed-price and the market price for power is calculated. If the contracted price falls below the market price, the buyer receives the difference. If the fixed price is higher than the market price, the buyer pays the difference to the developer.

In the U.S., PPA projects can be located in any deregulated, wholesale energy market. Buyers can be located in the same grid region as the project for a retail PPA or in a completely separate location for a financial PPA.⁴


⁴ Learn more about the difference between financial and retail PPAs in our blog.
Outside the U.S., nuances apply to individual countries, as well as regions within a country where projects are located. In India, for example, there are state-specific incentives that make PPAs more attractive in regions such as Bangalore, Tamil Nadu, and Karnataka.

Once an organization becomes the “off-taker” of a project, or piece of a project, it can use that purchase to help it achieve a variety of goals. Typically, PPAs have been used to meet environmental commitments, either towards carbon reduction or renewable energy acquisition. In recent years, economics have become a primary driver behind the C&I appetite for PPAs, which makes these contracts broadly appealing for a buying audience that reaches far beyond the likes of Google.

The Advantageous Economics of PPAs

There are three primary ways that PPAs can financially bolster an organization: 1) bottom-line impact, 2) short position exposure, and 3) financial risk management.

**Bottom Line Impact**

Worldwide, the cost of generating renewable energy continues to decline, with the most notable reductions in the price of new solar, which reached historic lows in 2016 and is now the cheapest form of electricity in some areas. Prices for U.S. wind and solar are particularly attractive thanks to the Production Tax Credit (PTC) and Investment Tax Credit (ITC), federal subsidies that have further reduced the cost of these technologies. Other global regions, such as India, are also offering subsidies to drive renewable energy adoption.

Power generation that is dependent upon technology, and not on the fluctuating price of fuel, allows wind and solar developers to lock in a fixed-price for their power. Historically, to achieve the dual goals of using renewable energy and fixing a price of power for the long-term, an off-taker would have expected to pay a

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premium. The rapid adoption of long-term renewable energy of late has coincided with a paradigm shift: it is now possible to lock in long-term renewable energy at a discount—rather than as a premium to brown power—in many markets.

The fixed price agreed to in the PPA includes a very low cost escalator over the 12 – 20 years of the contract, whereas the spot market for electricity—which includes power generated from a variety of sources—is subject to rapid oscillation. Indeed, electricity is one of the most volatile commodities in the world.\(^6\) Electricity prices are dependent on the supply of energy, as well as the demand, and tend to have seasonal peaks. This instability in the market benefits the PPA off-taker, who receives a dividend whenever the spot price for power rises above the fixed PPA price.

2017 is a particularly strategic year to take advantage of the low price of wind PPAs in the U.S. In order to earn full credit under the PTC, developers had to start construction on projects by the end of 2016. The American Wind Energy Association (AWEA) reported in the 3rd quarter of 2016 that over 20,000 MW of new projects were either under construction or in advanced development.\(^7\) These projects will now have four years to reach commercial operation in order to receive the full PTC incentive, and they need off-takers to secure financing. With a finite number of projects, now is an opportune time for C&I buyers to look at wind PPAs with outstanding financial terms.

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Short Position Exposure

Another key economic driver behind PPAs is the natural electricity short position that nearly all companies find themselves in. In most markets it is impossible to purchase electricity more than 2-3 years into the future, which subjects organizations that intend to operate over the long-term to unpredictable market price fluctuations. Fossil fuel generated electricity prices are expected to increase over time as the demand for coal and natural gas outpace supply, and as extraction costs—related to reserve development and the transportation of coal/gas—go up. In this short position, the fixed price of power behind a long-term renewable energy PPA serves to mitigate an organization’s exposure to the volatile market price.

Due to their relative stability, renewable energy PPAs are also useful to multinational organizations that operate in regions outside the U.S. By relying on technology, construction, and financing that is predictable and fixed, PPAs create a steady source of generation in areas such as Mexico and India, where grid reliability fluctuates. This stability provides additional value for C&I buyers looking to reduce their market risk and short position exposure in these regions.

Financial Risk Management

For many C&I buyers, the primary motivation to execute a PPA is to manage a myriad of risks that have potential to materially impact operations. These risks include an energy short position, as described above, alongside environmental risks, like the impact of carbon emissions on climate change, and regulatory risks, like carbon pricing.

Carbon risk, and the need for companies to take action, has dominated the agenda of several NGOs—including WRI, CDP, and BSR—over the past year. Though many governments have set aggressive carbon reduction goals under the Paris Agreement, a gap exists between the recommended warming threshold of 2 degrees and our present warming trajectory. Avoiding the worst impacts of global warming is dependent upon private industry adopting voluntary, science-based carbon reduction targets.

For the C&I sector, these impacts pose a very real threat to business-as-usual. Future carbon regulation, such as an imposed carbon tax, could economically hinder organizations to a dramatic degree. Natural disasters related to climate change—such as flooding and drought—are already wreaking havoc on the availability and price of raw goods and water all over the world. In 2011, extreme weather events accounted for 8 of the 10 most costly expensive natural catastrophes of the year, resulting in nearly US$150B in losses.

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8 To learn more about how PPAs can help mitigate risks, download our white paper.


Carbon risk comes with a human cost, as well. Climate change is predicted to reduce global incomes 23% by 2100,\textsuperscript{11} with areas that are facing warmer than average temperatures—such as the production hubs of Southeast Asia—to experience the greatest losses in economic activity. Warming temperatures also lead to increases in infectious disease, human displacement, and warfare.

PPAs directly address carbon risk by lowering the C&I buyer’s footprint. Not only does this action help to mitigate the impacts of climate change on a large scale, but buyers also gain access to the various co-benefits of PPAs, including pollution reduction, water savings, increased energy security, and economic stimulation via job creation.\textsuperscript{12} Consider, for instance, AWEA’s estimation that U.S. wind power led to a US$7.3B savings in public health expenditures in 2015 alone.\textsuperscript{13}

\textbf{Renewables Are No Longer Simply About Doing the Right Thing}

For nearly a decade, C&I buyers were encouraged to purchase renewable energy at a premium because it was the right thing to do. It was—and remains—a competitive advantage in an increasingly conscious world.

Today’s institutional buyer does not have to sacrifice economics for environmental responsibility. Favorable structures like PPAs allow C&I buyers the ability to meet both goals simultaneously, while taking advantage of numerous co-benefits in the process.

To learn more about how renewable energy can economically favor your organization, we invite you to visit www.renewablechoice.com.

\begin{enumerate}
  \item Learn more about the co-benefits of renewable energy in our blog.
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Contributors

John Powers VP OF STRATEGIC RENEWABLES  
303.551.7582 • JPOWERS@RENEWABLECHOICE.COM

John Powers is the VP of Strategic Renewables for Renewable Choice Energy. Mr. Powers has served Renewable Choice in a variety of leadership roles including top salesperson, manager of the consumer business, and head of the Environmental Commodities division. Mr. Powers currently manages the PPA division and oversees all corporate and institutional PPA processes. Mr. Powers is recognized as a trusted leader who brings considerable technical and market expertise to every partnership. Considered a foremost authority on renewable energy buying in the C&I sector, he is a frequent presenter at industry events. Mr. Powers is a LEED Accredited Professional with a BSE in Mechanical Engineering from Duke University.

Amy Haddon VP OF COMMUNICATIONS & ENGAGEMENT  
303.551.7584 • AHADDON@RENEWABLECHOICE.COM

Amy Haddon is responsible for driving communications, marketing, and sustainability strategy for Renewable Choice Energy. Amy also works closely with Renewable Choice clients to design and execute communications strategies and content that highlight their commitment to clean energy and sustainability. Concurrent to her role at Renewable Choice, Amy served for five years as the marketing manager and a sustainability consultant for Renewable Choice’s former subsidiary, Mosaic Sustainability, where she led consulting engagements with several top international brands. She is a frequent contributor to the conversations on renewable energy, sustainability, and responsible business. Amy received her M.Ed. from Colorado State University.