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# Table of Contents

Executive Summary .....	3
A Dynamic Renewable Energy Market .....	3
The Value of Power Purchase Agreements .....	4
Onsite PPAs .....	4
Offsite Retail-Sleeved PPAs .....	4
Offsite Financial PPAs .....	5
Market Leaders are Using PPAs .....	6
Philips .....	6
Digital Realty .....	6
T-Mobile .....	6
<b>SIDEBAR:</b> What to Consider .....	6
Conclusion .....	7
About Energy & Sustainability Services .....	7

This guide is for informational purposes only and not for the purpose of providing legal advice. Although we go to great lengths to make sure our information is accurate and useful, we recommend you consult a lawyer if you want legal advice.

# Executive Summary

There is a paradigm shift underway in renewable energy. After generations of renewables being more expensive than fossil fuel-based electricity, the cost of utility-scale solar and wind projects have now reached grid-parity, bringing the overall cost of renewable energy in many markets below conventional rates for power. This shift has created an opportunity for forward-thinking companies to save money on their power costs, or to even make money as a seller of clean energy, while meeting or exceeding corporate sustainability goals.

## A Dynamic Renewable Energy Market

Renewable energy has experienced dramatic growth in the past decade, and it shows no signs of slowing down as sensitivity to climate change and extreme weather events, long-term energy interests, and energy market volatility grow. Both wind and solar have increased their capacity exponentially: in 2005, for example, total global wind power capacity was less than 59 gigawatts (GW); in 2016 the total global wind capacity was over 467 GW.<sup>1</sup> Likewise, global capacity of solar power has seen nearly 60 times growth since 2005, peaking out at 295 GW total capacity in 2016 and continues to grow.

The primary catalyst of this change is the falling cost of wind and solar power. Since 2010 alone, solar installation prices have declined by more than 70%. Advances in technology, economies of scale, and financial incentives are driving enormous drops in the cost of renewable energy projects. The rapid decline in price, along with favorable public policy and financial incentives in some markets, have led to these large increases in new project development.

Another driving factor for renewable energy adoption is market volatility. In many developed countries, electricity markets are largely correlated with natural gas prices, as natural gas is the most readily dispatchable resource. In the past decade, natural gas has experienced dramatic price swings. However, the recent boom in global natural gas production has reduced the spot market in some areas to record lows—yet lack of liquidity in the forward price curve makes it nearly impossible to buy a natural gas hedge more than a few years in the future.

Renewable energy, on the other hand, is remarkably stable in price. Since there are no fuel costs for renewables, the price is the cost to develop a project, amortised over the life of the project. A locked-in price for renewable energy can be purchased today for use over decades into the future, something that is impossible in the volatile fossil fuel market.

A final reason renewable energy is undergoing such a dramatic paradigm shift is that developers currently have large pipelines of potential projects they wish to develop, but limited ability to bring these projects to market, as they need credit-worthy buyers for the electricity and an investor for the tax equity generated by the project. This need creates a dynamic that utility companies and financial institutions have benefitted from for years; by joining them through the establishment of a power purchase agreement, companies have the opportunity to take control of their energy costs while concurrently supporting the growth of global renewable energy.

1. Data from International Renewable Energy Agency (IRENA) <https://www.irena.org/en/wind>

This paper details the how and why of three common types of renewable energy power purchase agreements (PPAs) in use by commercial & industrial buyers: onsite, retail-sleeved (direct) offsite, and financial (virtual) offsite.

## The Value of Power Purchase Agreements

A power purchase agreement (PPA) is a reciprocal, financial relationship between an electricity generator (the seller), who owns the project, and a dedicated purchaser of the electricity (the buyer). PPAs play a key role in financing and developing electricity projects and are most commonly struck between large-scale projects and utility companies.

However, new PPA models, including onsite (or distributed) generation, retail-sleeved (or direct) PPAs, and financial (or virtual) PPAs, are becoming an increasingly competitive and progressive way for non-utility organisations to purchase renewable energy while simultaneously hedging fossil fuel costs. These PPAs can have a variety of benefits for the buying organisation, including:

- An established, long-term energy price, with the potential to save on energy costs or even make money as a seller of clean energy over time
- No operations and maintenance responsibilities
- Minimal risk
- Revenue potential for the sale of excess electricity and/or certificates of origin
- Environmental attributes that help meet sustainability goals
- Financial support for projects that would not be built without the PPA

While the majority of PPAs to date have been executed in the U.S., there are viable PPA opportunities in many established and emerging global markets, including India, Mexico, Australia, Poland, Belgium, the Netherlands, and the UK, among others.

### Onsite PPAs

The most common type of onsite PPA is solar photovoltaic (PV), especially for buyers with decentralised centres of operations or large rooftop footprints (although ground-mounted solar PV is also used). Solar's rapidly falling price is creating new opportunities for companies to install PV onsite. While organisations can realise long-term cost savings by installing their own solar system, the upfront capital expenditure costs can be a barrier. New innovations in solar, including 3rd party PPAs and leasing models, put the burden of the costs and performance risk on the leasing agent or financier.

In many solar PPAs, the developer owns, operates, and maintains the solar system while the buyer agrees to host the system on its building or property while also purchasing the electricity from the system over a pre-determined period. This symbiotic relationship allows the buyer to receive stable, renewable energy while the developer receives a valuable source of income. This "solar services" model allows buyers to avoid many barriers to adoption including the initial capital required to install the system, equipment performance risk, and complicated permitting processes.

### Offsite Retail-Sleeved PPAs

In an offsite retail-sleeved PPA, a contract is established between a company and a power producing facility to purchase the electricity generated by that facility. Companies with a large energy footprint in a single state or narrow geographic region are good candidates for this type of PPA, as the clean power is directly delivered to the account of the facility purchasing that energy via the electricity grid.

Under some regional provisions, companies can buy power directly as a wholesale market participant. In this arrangement, the individual buying organisation is responsible for firming and shaping the intermittently generated wind or solar electricity to fit actual operational demands. As a result, this can be a complicated option.





Another, and easier, retail PPA model is to work with an alternative supplier in a deregulated market. In this situation, a company contracts for the power delivery and the supplier takes on the burden of shaping and firming the power for a price.

Companies can also choose to work directly with local utilities to create a tariff allowing the organisation to purchase a contracted volume of power. While this model makes the PPA arrangement relatively easy, it is dependent upon individual region or country regulations, utilities, and the relationships that a company has established with those utility providers. In practice, these utility pass-through arrangements rarely produce the same level of cost-savings as working directly with a wind or solar developer.

Retail-sleeved PPAs provide companies with many choices. Under this model, power can be purchased from a new or existing project. Progressive organisations can choose to sign on with a project that has not yet been built and wouldn't be built without the organisations' financial support; in these cases, companies may find that they can receive a highly competitive energy price, while also making a considerable environmental impact—with a great story to tell for marketing purposes. Signing on with a project that has recently been built may allow for a shorter-term contract and is a good choice for organisations feeling their way into the PPA opportunity.

### Offsite Financial PPAs

Also called a *contract for differences*, *synthetic PPA*, *virtual PPA*, or a *fixed-for-floating swap*, financial PPAs allow companies to contract directly with renewable energy projects, bypassing the utility provider. Google pioneered these arrangements, along with several large universities, and an increasing number of corporations—such as Amazon Web Services, Johnson & Johnson, Nestle, Facebook, Nike, Kimberly-Clark, and AT&T—have followed suit by developing their own financial PPA projects.

In a financial PPA, the buying organisation does not take physical delivery of the renewable electricity being generated. Instead, the company contracts with the generating facility for the power and then re-sells that electricity to the market for the spot market price. As a result, these projects can be located in any deregulated region while the buying organisation still receives the financial and environmental benefits.

Financial PPAs have opened the market for renewable energy contracts to a much larger and hungrier group of buyers. By divorcing the source of renewable energy from an organisation's operational facilities, companies have their choice of projects from developers across geographies, allowing them to compete for the best projects at the best price.

In addition, financial PPAs allow organisations to pool their electricity demand from all operational facilities in a target market, giving the purchasing organisation greater buying power and leverage, as well as more competitive pricing. While the long-term hedge value may be less than with a retail PPA, companies stand to save considerably on their electricity expense by signing a financial PPA.

## Market Leaders are Using PPAs

An increasing number of global 500 organisations have made public commitments to renewable energy generation via PPAs in recent years. In 2015, for the first time, corporate demand for wind power in the U.S. outpaced utility demand and made up 52% of newly contracted capacity. The following year, corporate buyers were responsible for nearly 2.2 GW of renewable PPAs, and 2017 in the U.S., rivaled 2015, with a total of almost 3.2 GW of renewable energy contracted by corporate buyers. Globally, corporations signed a total of 5.4 GW of clean energy contracts in 2017. Now more than ever, market leaders are moving clean energy to the forefront of corporate agendas. Brief case studies on three forward-thinking organisations—Philips, Digital Realty, and T-Mobile—are below.

### Philips

In 2015, Philips joined the RE100 program and pledged operational carbon neutrality by 2020 as part of a COP21 commitment. To achieve their goal, Philips has worked to reduce the company's carbon footprint using minimal capital. This intention led the company to execute a financial PPA. Philips chose a PPA because the large-scale size of the project would provide significant impact to its carbon neutrality goals, help the company meet its RE100 commitment, and create a positive cash flow to operations, without a capital investment. In 2016, Philips joined a unique consortium with AkzoNobel, Google, and DSM, to jointly source long-term power from renewable energy projects in the Netherlands. As a first step in their partnership, these four leading companies agreed to source 350,000 MWh a year from a wind farm in the Netherlands.

### Digital Realty

Digital Realty is a Real Estate Investment Trust (REIT) with a portfolio of over 26.1 million square feet of wholesale, enterprise-scale data centre space in more than 32 global markets. The company provides both digital real estate as well as collocated real estate to meet client needs across a variety of configurations. Digital Realty began offering carbon-free computing choices to clients in 2015 via its Clean Start<sup>SM</sup> program, executed an 88 MW financial PPA in 2016, and signed PPAs for another 99 MW of wind and solar projects in 2017. Through long-term renewable energy contracts, the company will avoid approximately 515,000 metric tons of carbon dioxide per year.

### T-Mobile

In 2017, wireless leader T-Mobile signed a financial PPA for up to 160 MW from the Red Dirt wind project in Oklahoma and in 2018 joined the RE100 and announced another 160 MW financial PPA for the Solomon Forks wind project in Kansas. Combined, these two wind farms meet 60% of the company's electricity needs in the U.S., and will cut energy costs by around \$100 million over 15 years. The projects also help T-Mobile increase efficiencies and green the footprint of the company's operations, including retail stores, call centres, and network operations.

## What to Consider

### There are a number of considerations for companies interested in pursuing PPA options:

- Investment size can vary depending on project. Retail or financial PPA projects generally require no initial cash outlay, whereas an onsite installation may necessitate considerable initial capital investment and ongoing maintenance costs.
- Nearly all PPAs have the potential of long-term cost savings, but the level and speed at which those savings are realised is determined on a deal-by-deal basis.
- Contract lengths can differ and the right length is a significant decision point for many companies. Organisations looking for a shorter-term commitment of less than 10 years can typically pursue an existing PPA or competitive power project. Companies willing to make a longer-term commitment can take advantage of the compelling economics of a new retail or financial PPA or onsite generation. Smaller tranches of projects are becoming increasingly available, alongside joint venture, or club-type aggregated purchases.
- Finding the right project can be challenging. There are many options for companies to choose from, and each buyer and seller must work within existing regulations and policy. Working with an advisor such as Schneider Electric can help you narrow your selection and support your decision-making processes. A good advisor will use a competitive RFP process to ensure you receive the best possible outcome from a price and risk scenario, as well as supporting you to educate and engage internal stakeholders to get the PPA across the finish line.

## Conclusion

As the cost of utility-scale solar and wind projects reaches—and decreases beyond—grid parity, organisations are solidifying their renewable energy commitments and taking their strategies global. 340 companies, to date, are setting science-based carbon reduction goals, and more than 125 companies worldwide have joined the RE100 with a commitment to go 100% renewable.

While a PPA is a complex decision with long-term implications for any organisation, there has never been a better time for companies to pursue utility-scale renewable energy for their electricity demands. As models like Philips, Digital Realty, and T-Mobile demonstrate, the opportunity to integrate renewables into any corporate energy strategy—with the potential to realise significant cost-savings over time—has become a viable, competitive market choice.

As a leader in the industry that has collectively advised on over 3 GW of new wind and solar capacity worldwide, the expert staff at Schneider Electric provides global organisations with credible solutions to energy needs. We work closely with our corporate and project development partners to identify synchronous prospects, while simultaneously addressing all the opportunities and challenges associated with a long-term energy strategy. [Contact us](#) to learn how our cleantech experts can help you.

## About Energy & Sustainability Services

Schneider Electric Energy & Sustainability Services (ESS) group is a pioneering global supplier of renewable energy and clean technology products and services for the commercial, industrial, and institutional (C&I) sectors, including the New Energy Opportunities (NEO) Network. The division serves customers in over 100 countries and provides unparalleled experience and expertise on strategic renewable energy execution. ESS has advised on more than 3 GW of new wind and solar capacity and is the recognised leader in cleantech advisory services. To learn more, visit [www.schneider-electric.com/ess](http://www.schneider-electric.com/ess).





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