

U.S. Clean Energy Buyer's Guide

A practical guide to renewable energy procurement



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About the author



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Head of USA, Interim COO

Emilie Wangerman brings 13 years of energy industry experience across energy procurement, customer programs, operations, power marketing, acquisitions, and growth strategy to her role as the Head of USA, Interim COO for Lightsource bp. She joined Lightsource bp in late 2017 to significantly accelerate expansion into the U.S. market. Since then, the U.S. team has developed more than 3.4GW of projects, raised more than \$4 billion in project financing, and built a strong pipeline of over 30GW. During 6 years under Emilie's leadership, the business development team executed more than 4GW of power contracts with a wide range of power purchasers that include universities, utilities and well-known brands such as McDonald's, eBay, Verizon, and Amazon. The team also acquired over 15GW of projects to support the greenfield pipeline.

Prior to Lightsource bp, Emilie held leadership positions at Pacific Gas and Electric ("PG&E") and Intel Corporation. Emilie received a Bachelor of Science in both Chemical Engineering and Psychology from Rensselaer Polytechnic Institute, a Master of Business Administration at Duke University's Fuqua School of Business, and a Master of Environmental Management at the Nicholas School of the Environment.

Executive summary

Clean energy procurement is not a one-size-fits-all process.


The best choice for your company depends on multiple factors, including your goals, geographic location, and energy needs.

This guide is designed to lead you through the five decision-making factors that determine the best clean energy solution for your company.





Overview


The **five factors** that determine the best clean energy path for you.

1.  **Why are you buying?**
Identify your company goals and objectives.

2.  **Who makes decisions?**
Assemble the proper team and get the buy-in you need.

3.  **Where are your operations?**
Your geographic location determines your options.

4.  **How much energy do you need?**
Size and scope depends on your business structure, goals, and location.

5.  **What makes the most sense for your company?**
End goal is to choose the procurement method that meets the right balance for your needs and opportunities.

Clean energy procurement is not a one-size-fits-all approach. Several important factors determine which product is best for your business.



Corporations can make an impact and drive change to protect our climate.



Our job is to help companies like yours cut emissions and power your operations with clean, renewable energy.



Interest in renewable energy is surging as businesses seek to reduce energy risks.



The synthesis report for the [Intergovernmental Panel on Climate Change](#) released in April 2023 highlighted the stakes:

“Climate change is a threat to human well-being and planetary health ... There is a rapidly closing window of opportunity to secure a livable and sustainable future for all.”

Google and Amazon are not the only corporations buying clean energy. [More than 300 U.S. companies are buying renewables](#), and [two of three clean power purchasers globally in 2023 were U.S. companies](#).

Some of this growth is driven by investor interest in sustainability, and for many companies, buying renewable energy is also an economic decision. Solar is one of the lowest-cost resources available, which is why it's also one of the fastest growing new forms of energy.

Many businesses purchase solar because it stabilizes their energy costs through long-term contracts. They also enjoy the upside of meeting ESG (Environmental, Social and Government) goals.

[By the middle of 2023, there were 30GW worth of clean energy Power Purchase Agreements, almost as many as there were in all of 2022.](#)

What are the main questions to consider?



Company goals

- » What is most important to your company?
- » Are you working toward your RE 100 goals?
- » Do you seek to add renewables to the grid to achieve additionality?
- » What type of emissions are you focused on – Scope 1, 2 or 3?



Geography

- » Where are your facilities located?
- » Are they in a deregulated market, where you can choose your electricity provider, or are they in a regulated market where you have an assigned electric utility?
- » Do you have access to land where we could install a solar farm?
- » Do you have your own electricity infrastructure or sub-station to support a project?



Energy demand

- » What types of electricity needs do you have?
- » Do you have a few large factories that use a lot of energy, or many smaller facilities spread across many regions?
- » Do you have a factory that must run 24/7 or facilities that do not have a flat energy profile?

Clean energy procurement options

There are lots of different ways to achieve your clean energy goals. One of the most common methods is a Power Purchase Agreement, or PPA, described below along with other procurement vehicles you might consider.

PHYSICAL POWER PURCHASE AGREEMENT (PPA)

A Power Purchase Agreement (PPA) is a popular procurement method in which a company buys the physical energy from a renewable energy project along with the renewable energy credits (RECs). The energy buyer agrees to purchase the power from a renewable energy project and associated RECs at a prearranged price. The power is physically delivered to the buyer from the generation site. Physical PPA buyers must have the ability within the relevant regulatory scheme to take direct possession of the energy. This often requires a wholesale license. Some corporations work with utilities and retail providers to “sleeve” physical renewable energy to them on their electricity bills. Learn more in this [Physical PPA explainer video](#).

VIRTUAL POWER PURCHASE AGREEMENT

A VPPA allows a company to buy renewable energy “virtually” along with RECs. This method works well for a company who is doing business across many different regions. In a VPPA, the energy buyer and seller agree on a prearranged price for the power coming out of a renewable project. But that power is sold into the market rather than being delivered to the buyer (as with a physical PPA). If the market rate for power exceeds the VPPA price, the producer sends the buyer the difference. If the market rate is less than the VPPA price, the buyer covers the difference. With this option, you’ll obtain RECs and you’ll actually contribute to new renewable energy construction. Learn more in this [VPPA explainer video](#).

RENEWABLE ENERGY CERTIFICATES (RECS)

When solar producers generate electricity, they earn RECs, which represent the clean energy attribute of that electricity. Corporations can offset their existing emissions by buying that REC; but procuring RECs does not mean you will be receiving the energy from that project, nor does it guarantee that the project was built because of the contract. This structure may fail to induce “additionality” because you may be purchasing RECs from an existing project versus contributing to the construction of new renewable energy. RECs can be purchased as “spot” or under long-term contracts.

ENERGY ONLY

You can buy the energy directly from a renewable energy project without the corresponding RECs. In doing so, you would not acquire the environmental attributes of the project. With this option, you cannot claim recognition for the environmental benefits because someone else might purchase the renewable energy credits (RECs). There are several contract structures available to purchase energy. You can purchase RECs from other projects to support your sustainability claims.

Why?

Why are you buying clean energy?

What company goals and objectives are you supporting?

MANAGING COSTS

Many companies are opting for renewable energy, especially solar, because it can save money over the long term. The cost of electricity and solar vary depending on which markets you operate in.

Even in higher-priced energy markets like New York or the Mid-Atlantic, solar prices may be significantly lower than the company's current electricity prices. Using a **Physical Power Purchase Agreement (or physical PPA)** provides these customers or "buyers" with long-term predictable energy costs and limits the effects of market volatility on their electricity spend.

Buyers may also save money by procuring only the energy from the solar project without the project's environmental attributes, which allows the seller to offer a lower PPA rate as the seller can monetize the environmental attributes separately. Buying energy-only allows a company to enter renewable procurement with the option to add the environmental attributes for an incremental fee later when the company is prepared to spend extra.

Buyers may also use a **Virtual Power Purchase Agreement (VPPA)** to buy clean energy instead of a physical PPA. This means the buyer will not physically receive the energy from the solar project but may still save money by taking advantage of market volatility. In a VPPA, the buyer benefits when the contract's set rate, also known as the "strike price," hedges against high energy market rates. For instance, when market prices spike during a heatwave or a deep freeze, VPPA customers profit from the difference between the high energy rates and their contract's strike price. They then use this revenue to offset their higher electricity costs incurred during those high-priced weather events.

Buyers in lower-priced regions may contract for **renewable energy credits (RECs)** alone, which enables them to buy clean energy credits without exposure to energy market volatility. However, RECs alone, while affordable and simple, may not give your company sufficient climate or sustainability credit. If your company really wants to be a leader in the climate movement, you will most likely need a PPA.



PURSUING SUSTAINABILITY GOALS

Many clean energy buyers want to advance Environmental & Social Governance (ESG) goals even if sustainability isn't their primary motivation. Companies prioritizing affordability first and ESG second may opt for a VPPA with "replacement RECs" (e.g., [CRS listed or Green-e eligible](#)). This is a lower-cost option, where the seller offers a reduced rate for the PPA because they sell the project's environmental attributes to offset their costs and provide replacement RECs to support buyer's sustainability goals.



For example, consider Lightsource bp's partnership with SEPTA, the Southeastern Pennsylvania Transportation Authority. Our Elk Hill Solar projects support SEPTA's sustainability goals while cutting their electricity costs. SEPTA opted to procure energy through a VPPA with replacement RECs. SEPTA had two goals – investing in renewable energy and reducing electricity costs. This structure enables both. You can learn more about the Elk Hill Solar projects [here](#).

If your company wants to buy clean energy primarily as an ESG investment, you may need to do more than buy RECs alone or replacement RECs. RECs can count toward RE100 goals but they do not go as far in advancing ESG tracking or shareholder commitments relative to project-specific energy and REC procurement. Companies who prioritize ESG often support new renewable energy projects through physical or virtual PPAs. These deals not only count toward RE100 goals but they drive the development of new renewable energy: so-called "additionality." By using a physical PPA, companies gain the same environmental benefits as the virtual PPA but go further by replacing their current traditional energy supply with clean solar energy.



ENGAGING FOR LOCAL IMPACT

Buyers that want to make a local impact with their ESG investment can select a clean energy project located close to where they consume electricity, such as within the same wholesale energy market or even having a project built on their own land. This lets companies buy local energy, which directly supports the local economy by adding jobs and introducing opportunities for research partnerships and community engagement.



For example, consider Lightsource bp's partnership with Penn State. As a university in a high-priced electricity market, Penn State wanted to invest in renewable energy, help their local community and mitigate energy market volatility. Penn State chose a physical PPA for the energy and project RECs from our [Nittany Solar projects](#), which are located within Pennsylvania. Penn State leverages the affordable PPA rate to minimize their exposure to market volatility while also contributing local economic benefits and using the sites as living laboratories, where students and faculty engage with the project through tours and research.



You may choose a physical PPA for a local solar project's energy and RECs for big ESG impact.

Who?

Who makes decisions?

Assemble the proper team to get the buy-in and approvals you'll need

The role of the person overseeing energy purchases varies from company to company, but successful procurement requires commitment from the top. Attempts to source renewable energy often falter without the leadership team's support.

Who are the key team members?



CHIEF SUSTAINABILITY OFFICER (CSO)

Responsible for improving sustainability metrics and reducing greenhouse gas emissions, the CSO understands how renewable energy can help achieve corporate sustainability goals and plays an important role in garnering support from the C-suite.



CHIEF FINANCIAL OFFICER (CFO)

This official must be engaged in any decision to procure renewable energy to determine a contract's value, guide the approval process and ensure the contract provisions meet a company's financial and risk requirements.



CHIEF RISK OFFICER (CRO)

This person assesses competitive and regulatory threats and may be assessing a long-term energy contract to mitigate volatile energy prices.



PROCUREMENT TEAM

They can help ensure smooth implementation and will manage the day-to-day negotiations of the contract and may include long-term contract management as well.



ACCOUNTANT/COMPTROLLER

It is important to involve someone from your accounting department or your comptroller so that person knows about your commitments, especially if your purchase involves derivatives.



ACCOUNTING CONSIDERATIONS

Mark to market accounting – where values are adjusted based on market conditions – is used for projects that have derivatives, which are financial transactions for a tradeable product. A good example is a VPPA in which you have a [contract for differences](#) relative to the market. It's a financial transaction you're settling based on how the market is performing. If your business uses [IFRS accounting](#) (International Financial Reporting Standards), you're probably required to use mark to market accounting.

Who?

Who manages energy for your company?



FACILITIES MANAGERS

They understand how daily operations dictate energy needs for a specific facility or group of facilities. But a facility manager's scope may be limited to a specific site, while renewable energy procurement is sometimes managed on a broader scale across multiple locations.



CENTRALIZED ENERGY MANAGEMENT TEAM

This group can manage the negotiation of a clean energy contract to meet clean energy goals across a company's operation and service areas. With a physical PPA, the facility manager may be more engaged in the transaction and long-term management. But for a financial product, like a VPPA or another derivative, the transaction may be managed by the centralized team or the finance department.



ENERGY PROCUREMENT AND RENEWABLE ENERGY MANAGEMENT TEAMS

Large tech corporations with significant electricity demand, such as Google, Meta, or Microsoft, have such teams, while other companies may not have this level of staffing because they have less energy demand or are just starting to pursue renewable energy procurement.

The good news is renewable energy procurement is for any company, not just the Googles of the world.

Many companies use a centralized procurement team to handle contract negotiations and management, but if your company's management is engaged and has a clear plan, then you can procure renewables, even without such a team.



EXTRA HELP

This may feel like a lot for your organization, so you might want to consider extra help.



CONSULTANT

They work with you to identify your needs and manage the initial procurement and negotiation process for renewable energy.

Resources for energy buyers

Organizations such as the [Clean Energy Buyers Association](#) (CEBA) offer educational resources.



RETAIL ENERGY PROVIDER

They can help procure renewables on your behalf with portfolios customized to your needs. The retail provider would manage the risk as well as the contracts. As their customer, you are uniquely positioned to create demand for clean energy, and you might be surprised by how much leverage you have.

Where?

Where is your business operating?

Your geographic location determines your options

Energy purchasing options depend on *where* your business operations are located and whether that market is regulated, deregulated, or a hybrid. You will also want to consider whether you are looking for physical delivery or whether you will procure through a contract for differences, also known as a VPPA or financial settlement.

While your location may have some limiting factors, don't discount the amount of power you have — as a large employer, taxpayer, and energy customer — to secure a deal to achieve your clean energy goals.

REGULATED MARKETS

Thirty-one states have “regulated” electricity markets in which customers buy electricity through a pre-determined utility company; there is no competition in the marketplace. Utilities generate electricity and charge rates determined by a regulatory agency, often called a Public Utility Commission (PUC) or a Public Service Commission (PSC). These regulated markets are mostly located in the South, Midwest, and West.

The Federal Energy Regulatory Commission, (FERC), [describes a traditional wholesale electricity market](#) as one “where utilities are responsible for system operations and management, and, typically, for providing power to retail consumers. Utilities in these markets are frequently vertically integrated – they own the generation, transmission and distribution systems used to serve electricity consumers.”

If your business operates in a regulated market, and you want to procure solar energy from a project within that same market, you can coordinate with your utility so they may procure it on your behalf. This process is called “sleaving.”

Another perfect example of an energy customer leveraging their purchasing power to procure renewables is our [collaboration with Entergy and U.S. Steel](#).



U.S. Steel, a major industrial energy user, sought clean energy to power their advanced steel mill in Northeast Arkansas. U.S. Steel worked with their utility, Entergy, to source energy from our project in that market.

The [Driver Solar](#) project will be Entergy Arkansas' largest solar facility and will [power the production](#) of [verdeXTM](#): U.S. Steel's sustainable steel product, which is made from recycled steel content at the Big River Works facility.

Through collaboration, Entergy benefits, U.S. Steel benefits, and we as the developer can develop the asset to serve both the utility and customer's needs.

These days, many regulated utilities are expanding their portfolio outside of traditional fuels to include renewables. Utilities either develop renewables infrastructure independently or contract with developers like Lightsource bp to buy renewable electricity.

In 2023, [utilities procured more than 30 GW renewable-generated electricity](#), and growth is continuing.

Many utilities allow the purchase of renewable energy through what is called a "[green tariff](#)," which is a price structure or electricity rate for renewable energy that is offered by a utility and approved by the state's energy regulator. These tariffs allow eligible businesses to buy up to 100 percent of their electricity from renewable sources.

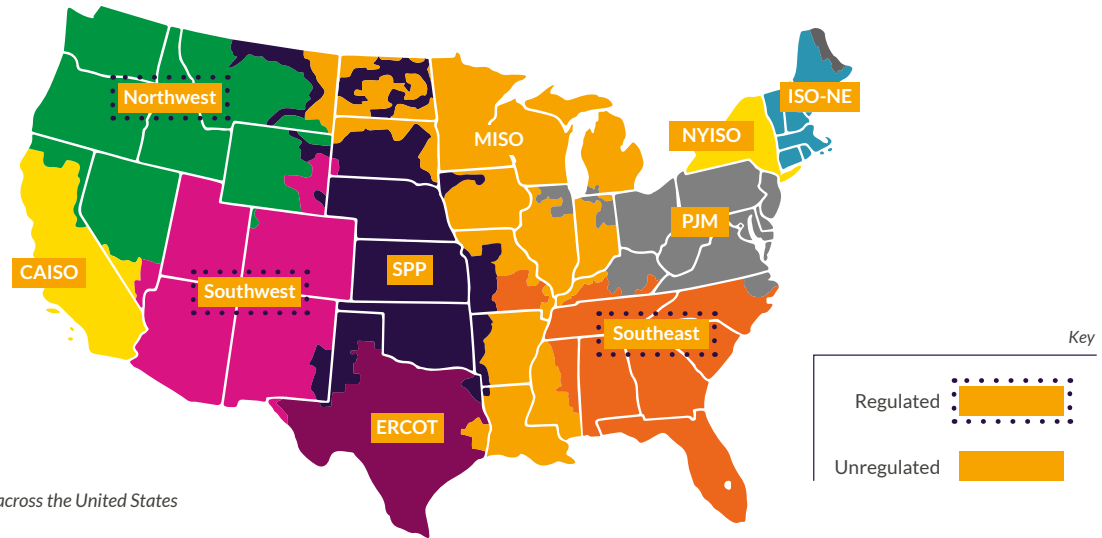
These arrangements often depend on whether the utility has sufficient renewable energy in its portfolio to meet total customer demand. When there is a shortfall, or limitations to the utility's procurement on your behalf, the alternative is to contract using a VPPA. One example of a VPPA project is L3Harris, [which has an agreement with Lightsource bp for our Elm Branch solar project in Texas](#).

The VPPA provides the additionality of a new clean energy project added to the grid and satisfies the need for renewable energy credits. However, the energy is not physically delivered to a business's operations.



DEREGULATED MARKETS

In a deregulated market, competition has been introduced through a wholesale market where customers are able buy and sell power from a variety of energy providers.



Regional Transmission Organizations across the United States

Businesses in deregulated markets, such as Texas, the Midwest, or the Mid-Atlantic states, can procure clean energy directly from the renewable power provider. The wholesale markets that are deregulated are referred to as [RTOs, or Regional Transmission Organizations, or ISOs, Independent System Operators](#).

In many cases, this is a simpler process, because the business is buying its energy directly from the provider.

The terms “regulated” or “deregulated” markets may be confusing, because all energy entities are regulated at some level. However, the term deregulated generally refers to whether you can buy and sell power on an open market or if you must work through a set utility.

HYBRID ARRANGEMENTS ACROSS THE COUNTRY

Businesses that have multiple facilities in regulated and deregulated markets often must navigate both systems to satisfy their electricity needs.

For example, a company that wants to expand into Georgia and use renewable energy will have to know first that it’s a regulated market and then find the utilities that provide green tariffs to help satisfy those electricity needs.

Other parts of that business may source their renewable energy directly from the provider, such as in Virginia, which has a deregulated electricity market.

Some companies may also choose to increase their VPPA commitments in deregulated markets if they can’t find renewable options in regulated markets in which they have business. That allows them to have an impact on renewables even if they can’t do so in the regulated markets in which they operate. Other companies may prioritized PPAs in energy markets dominated by coal or gas power generation, which enables them to make more of an impact in those “dirtier” markets than they could in places such as California, which has a higher percentage of renewable generation.

How much

How much energy do you need?

Size and scope of your project depends on your business goals and location

LOAD SIZE

Your options for buying solar energy also depend on how much electricity you need to buy – this quantification of your demand is often referred to as your **load size**. The other items we consider when evaluating load size are your time-of-day use and the distribution of your operations.

By this point, your business has assembled the team it needs to procure renewable energy. That team needs to assess your company's energy needs or your overall load. You need to know when you're using energy and how that use varies. You need a rigorous data management system to support your consumption. These data can help determine how you buy clean energy.



TIME-OF-DAY USE

If you want to ensure your electricity comes from renewable sources every minute of every day, you must understand when you use energy and how that varies minute-to-minute, hour-by-hour.

Right now, satisfying your electricity needs 24 hours a day with 100 percent renewable energy requires significant planning and a combination of agreements. It may not be completely possible. What makes it potentially possible is the growing number of storage technologies coming online.

If you are interested in 24/7 renewables, start with solar plus storage. Solar + storage technology can prolong the energy we capture on solar farms and extend that power to customers after the sun goes down. The combination may not cover your 24/7 load, but it offers the opportunity to better match your usage with renewable production.

The [Inflation Reduction Act](#) provides tax credits for investing in storage projects and manufacturing. The 2021 [bipartisan infrastructure act](#) also provides \$2.9 billion for storage research, and new technologies are being developed at a rapid pace. This investment, along with the growing need for energy storage to harness the full value of renewables, is expected to accelerate the growth in storage. We are already seeing storage make a difference. In recent years, California and Texas [saw storage provide enough electricity](#) blackout periods during intense heatwaves. As more renewables are integrated onto the grid, storage will help us continue to use those renewables while also maintaining reliability.

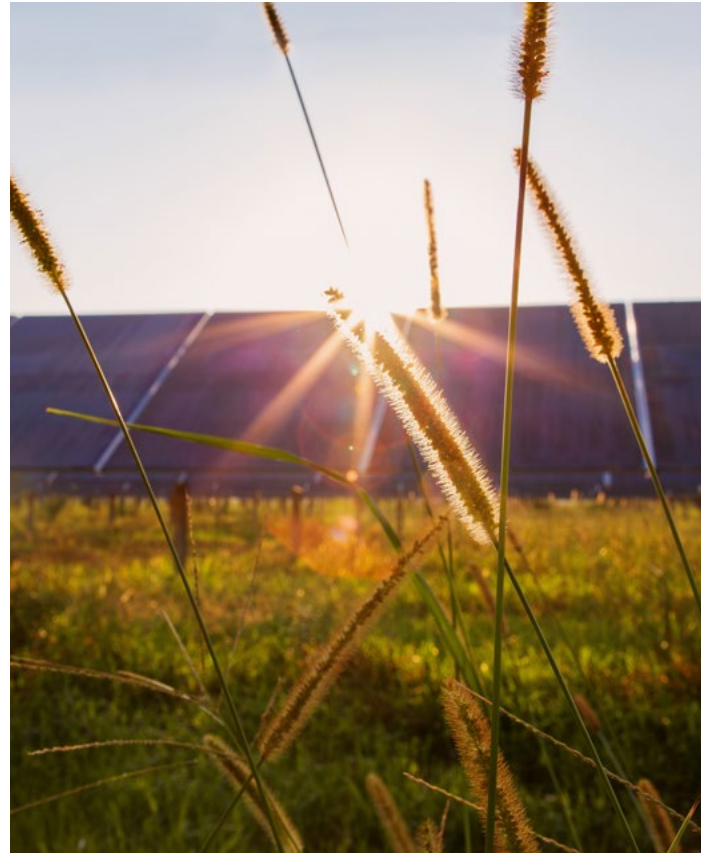
DISTRIBUTION OF OPERATIONS

Are your facilities dispersed or centralized? A centralized facility, such as a steel mill or data center, has well-defined energy needs throughout the day, week, month, and year. A dispersed set of facilities, such as multiple retail sites, require a different type of energy procurement, and energy use will vary across each facility.

Many of our customers seek to power much of their operations with clean energy. For those with a centralized facility, they can benefit from a single PPA, physical or virtual, to meet the needs of that particular facility. Driver Solar, a 312 MW DC renewable energy facility developed by Lightsource bp, will support U. S. Steel Corporation's objective of producing steel using renewable electricity and is situated adjacent to both the U. S. Steel's Big River Steel facility and the recently announced \$3 billion expansion.

For those with dispersed load or those who do not want to vary their operating profiles to match the clean energy profile, procurement of clean energy through virtual PPAs often works best. This especially makes sense for retailers who have many locations spread out across the country. For example, our new 345MW Oxbow solar farm will provide renewable energy to restaurant giant McDonalds and eBay, the online auction site and retailer. For McDonalds, what mattered to them was spurring action on climate change. With this power purchase agreement, McDonalds is using the clean energy to offset their electricity needs for facilities across the United States. In doing so, they are supporting what will be Louisiana's largest solar project, and simultaneously working towards their science-based emissions reduction target for 2030.

If it is important to ensure your operations are directly procuring local clean energy, you can enter into a physical power purchase agreement (PPA) to provide your power needs. In Pennsylvania, our 70MW solar farm is providing 25 percent of the overall needs for Penn State University. This is a more consolidated demand than the spread-out facilities of McDonalds and eBay.

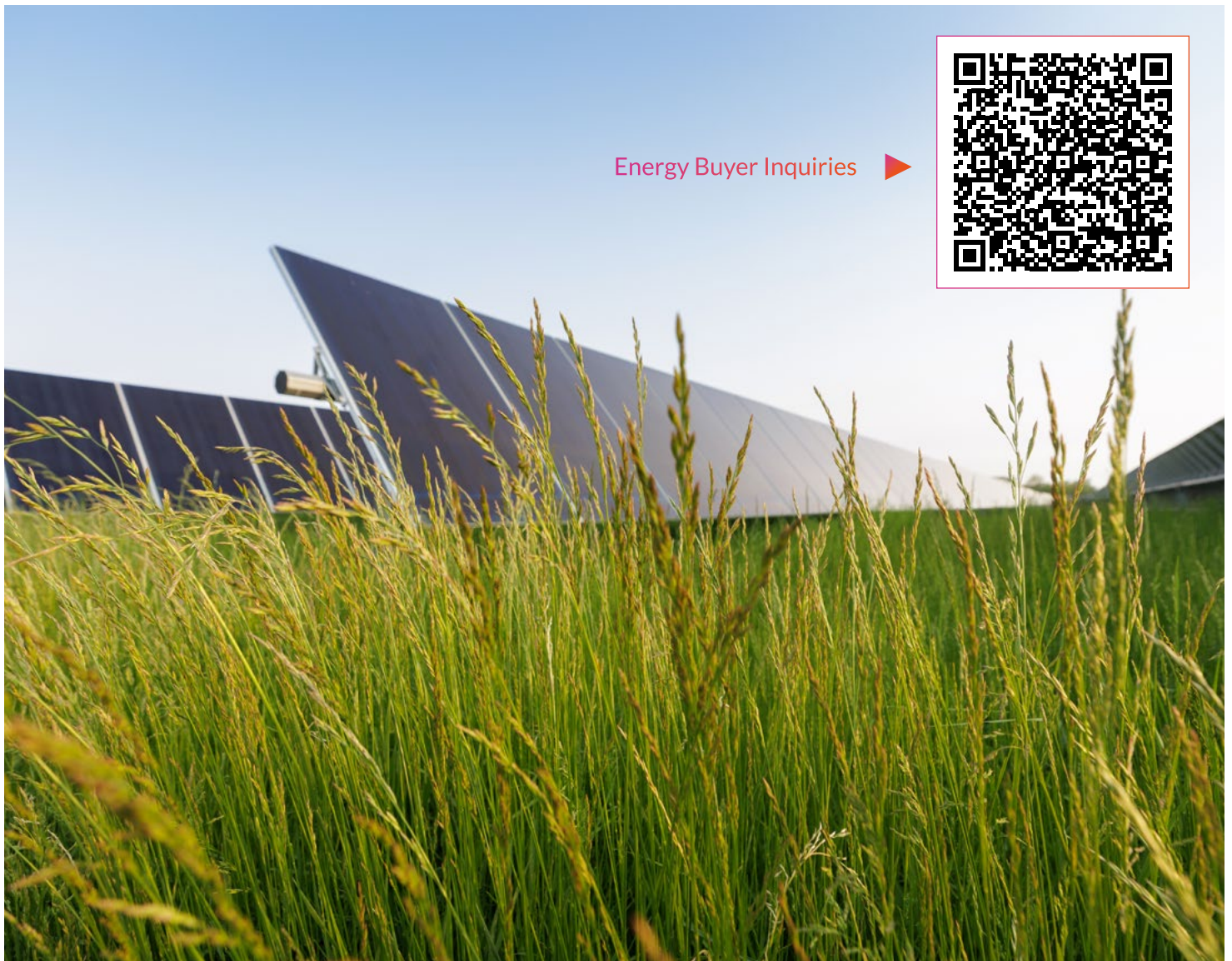


Conclusion

The goal is for you to find the best procurement method for your company. Each company is different, and your unique situation will impact which option is the best path forward for you. If you have any questions about the best way to do this, please let us know.

A completely renewable future is upon us. Each project takes us one step closer to achieving that goal.

The end goal is to choose the procurement method that is right for you.



Appendix

Accountant/comptroller.

It is important to involve someone from your accounting department or your comptroller so that person is aware of the commitments you are making, especially if your purchase involves derivatives.

Centralized facility.

This is a facility, such as a steel mill or data center, that has well-defined energy needs throughout the day, week, month, and year.

Chief Financial Officer (CFO).

This official must be engaged in any decision to procure renewable energy to determine a contract's value, guide the approval process and ensure the contract provisions meet a company's financial and risk requirements.

Chief Risk Officer (CRO).

This person assesses competitive and regulatory threats and may be considering a long-term energy contract to mitigate volatile energy prices.

Chief Sustainability Officer (CSO).

Responsible for improving sustainability metrics and reducing greenhouse gas emissions, the CSO understands how renewable energy can help achieve corporate sustainability goals and plays an important role in garnering support from the C-suite.

Deregulated markets.

In a deregulated market, competition has been introduced through a wholesale market where customers are able buy and sell power from a variety of energy providers.

Green tariff.

A price structure or electricity rate for renewable energy that is offered by a utility and approved by the state's energy regulator.

Independent System Operators (ISO).

This a deregulated wholesale energy market.

Load Size.

The quantification of your demand is often referred to as your load size — how much electricity you need to buy.

Physical PPA.

In this, a company buys the physical energy from a renewable energy project along with the RECs. The energy buyer agrees to purchase the power from a renewable energy project and associated RECs at a prearranged price. The power is physically delivered to the buyer from the generation site, which is built for the buyer.

Procurement team.

They can help ensure smooth implementation and will manage the day-to-day negotiations of the contract and may include long-term contract management as well.

Public Service Commission (PSC) or Public Utility Commission (PUC).

A regulatory agency that determines allowable utility charges in regulated energy markets.

Regional Transmission Organization.

This is a deregulated wholesale energy market.

Regulated markets.

In a regulated energy market, customers purchase electricity through a pre-determined utility company; there is no market competition. Utilities generate electricity and charge rates determined by a regulatory agency, often called a Public Utility Commission (PUC) or a Public Service Commission (PSC). These regulated markets are mostly located in the South, Midwest, and West.

Renewable Energy Certificates (RECs).

When solar producers generate electricity, they earn RECs, which represent the clean energy attribute of that electricity. Corporations can offset their existing emissions by buying that REC; yet procuring RECs does not mean you will be receiving the energy from that project, nor does it guarantee that the project was built as a result of the contract. This structure may fail to induce "additionality," because you may be purchasing RECs from an existing project versus contributing to the construction of new renewable energy.

Sleeving.

This is the process of procuring solar energy from a project in the same regulated market in which your business operates. It involves coordinating with your local utility.

Virtual Power Purchase Agreement (VPPA).

This allows a company to buy renewable energy "virtually" along with RECs. In a VPPA, the energy buyer and seller agree on a prearranged price for the power coming out of a renewable project. But that power is sold into the market rather than traveling to the buyer (as with a physical PPA). If the market rate for power exceeds the VPPA price, the producer sends the buyer the difference. If the market rate is less than the VPPA price, the buyer covers the difference. With this option, you'll obtain RECs and you'll actually contribute to new renewable energy construction.

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