Off-Site Renewable Energy Buyer's Guide for Real Estate

Transparent Energy
powering your decisions

ULI Urban Land Institute
Greenprint
Reducing Carbon.
Building Value.

About ULI

The Urban Land Institute is a global, member-driven organization comprising more than 45,000 real estate and urban development professionals dedicated to advancing the Institute's mission of shaping the future of the built environment for transformative impact in communities worldwide.

ULI's interdisciplinary membership represents all aspects of the industry, including developers, property owners, investors, architects, urban planners, public officials, real estate brokers, appraisers, attorneys, engineers, financiers, and academics. Established in 1936, the Institute has a presence in the Americas, Europe, and Asia Pacific regions, with members in 80 countries.

About ULI Greenprint

The ULI Greenprint Center for Building Performance is a research organization focused on climate mitigation and makes the business case for green buildings by tying carbon reductions to increased asset value. ULI Greenprint also includes a worldwide membership alliance of leading real estate owners and developers committed to improving the environmental performance of the global real estate industry, striving to reduce greenhouse gas emissions by 50 percent by 2030, and achieving net zero carbon operations by 2050.

About Transparent Energy

Transparent Energy (TE) is an energy management services firm that brings together the processes, expertise and technologies to take the complexity out of energy management and turn it into bottom-line savings for the businesses, organizations and governments we serve. Using our proprietary software and reverse auctions for transacting electricity, natural gas, and renewable energy, TE helps customers lower their total energy spend by leveraging a superior process and utilizing best in class planning which includes risk management, sourcing, sustainability, maximization of energy incentives, as well as continued energy management monitoring.

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About This Report

This publication provides an overview of off-site renewable energy options, and step-by-step instructions for real estate professionals to purchase off-site renewable energy for a building or portfolio, with several options for contracting to fit different real estate development strategies, ownership horizons, tenant requirements, and energy, sustainability, and financial goals. This guide is intended for U.S. real estate professionals in procurement, asset management, property management, engineering, and environmental, social, and governance (ESG) who have the mandate to execute on the corporate sustainability strategy and energy purchasing.

Note on Terminology

The renewable energy industry uses terms that often have a different meaning in the real estate industry. For the purposes of this publication, the following terms are defined as follows:

- **Customer/buyer—**Consumer of the renewable energy credit. For real estate, this generally means the real estate owner/developer of the asset/portfolio (not to be confused with a tenant/occupant who real estate often considers the customer).
- **Developer—**The entity that builds/develops renewable energy generation (not to be confused with a real estate developer who constructs buildings).
- **Generator—**The entity that produces the renewable energy (not to be confused with a backup power supply for business continuity).

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Executive Summary

The world has come to the realization that human activities cause climate change. The real estate industry, which accounts for 40 percent of all U.S. carbon emissions, is being asked by investors, lenders, tenants, and employees to reduce the environmental impacts of buildings. As a result, real estate owners are setting goals to reduce energy consumption through energy efficiency efforts and to purchase clean energy to meet remaining demand, which requires measurement and reporting processes.

One of the most advanced options for meeting those goals is renewable energy, either through on-site generation, such as using rooftop solar panels, or purchasing from off-site renewable energy projects, for example through power purchase agreements or community solar. The cheapest, cleanest unit of electricity is the one that is never consumed, so it is always recommended to focus first on energy efficiency at each property. However, some energy will always be needed to operate a building, and this is where the opportunity lies to procure clean energy.

The power grid is being transformed through the replacement of high-emissions power plants using fossil fuels with renewable energy power sourced from solar, wind, hydro, and other low-carbon or carbon emissions–free sources. A new set of contract options has been developed and continues to evolve to help real estate buyers purchase this energy produced off site.

Not all contracting options fit or are possible for every situation, given differing laws and regulations across countries, states, regions, and utility territories. When purchasing renewable energy, a real estate owner must undertake a thorough process to plan, source, evaluate, and contract for different renewable energy options. A combination of representatives from across a company seeking renewables procurement as well as outside experts are typically needed to implement a successful renewable energy project. This team sets goals, determines a measurement strategy, and evaluates the resource types and contracting options available at the property and portfolio levels.

Some supply options, like power purchase agreements and virtual power purchase agreements, can require long-term, 20-year commitments, but they provide long-term clean energy supply benefits. Because of the value and term of these agreements, approvals may need to be obtained from the highest levels of the organization. A combination of several renewable contracts and contracting types may be required to cover long- and short-term needs over time and to address changing portfolios.

Once a firm is ready to procure off-site renewable energy, it can follow this process:

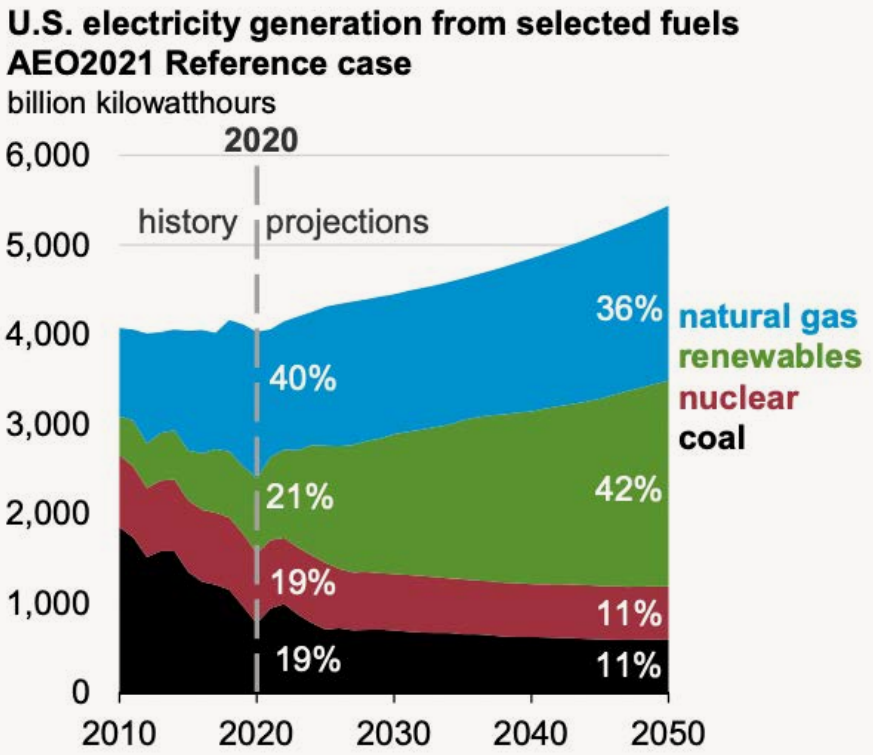
1. **Develop the procurement process strategy.** Determine the organization's overall strategy, priorities, goals, and constraints for procuring off-site renewable energy.
2. **Set the plan in motion.** Assemble the internal/external project team, identify vendors to send the request for proposals, and calculate the volume and timing of the deal.
3. **Evaluate and decide.** Conduct the procurement process and evaluate bids while considering appropriate contract terms and risks.
4. **Execute the deal.** Review the contract and negotiate contract terms that are congruent with the organization's risk tolerance.

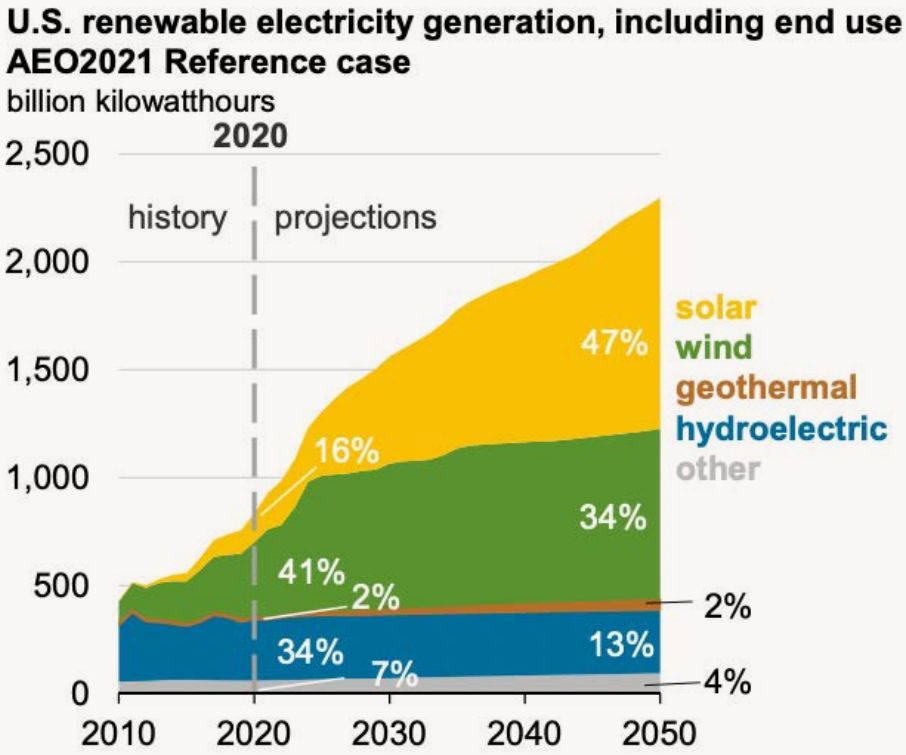
Renewable Energy Overview

Common examples of renewable energy are wind, solar, hydro, geothermal, and tidal, which all derive their “supply” from natural sources that emit no carbon into the atmosphere.

In addition to the common renewable technologies listed on the previous page, some jurisdictions or standards include energy sourced from waste as "renewable" energy. That can include biomass (e.g., wood or agricultural waste), municipal waste, land-fill gas methane, and farm-waste methane. These sources do emit carbon but may be considered "clean" by some definitions because they reduce greenhouse gas emissions or waste in other ways. Production from hydrogen, often through a fuel cell, may also be included, provided the hydrogen is produced using clean energy sources.

Carbon emissions data is classified into Scopes 1, 2, and 3. Scope 1 emissions are from systems on site, for example the on-site burning of natural gas or propane. Scope 2 emissions are produced off site but directly attributable to building consumption, such as from utility-provided electricity. Scope 3 emissions are more indirect, such as those from supply chain, customers, tenants, or corporate travel. Off-site renewable energy deals can offset Scope 1, 2, and/or 3 carbon emissions.





Source: U.S. Energy Information Administration, *Annual Energy Outlook 2021* (AEO2021) Reference case.

ON-SITE RENEWABLES

Although this report focuses on off-site renewable energy options, it is worth providing context to on-site systems that could be valid for certain asset owners.

Installation of on-site renewable energy systems, such as solar panels, fuel cells, geothermal systems, and small wind turbines, may be a viable option for some energy users and some sites. However, not all properties lend themselves easily to installation of such systems, and available space on the roof or elsewhere on the property may not be adequate to produce a meaningful amount of energy. Building codes, fire codes, or other laws or regulations may also pose challenges. Further, some real estate companies, like real estate investment trusts (REITs), have tax implications that prevent them from directly benefiting from on-site renewable federal tax credits.

In some regions, on-site projects have a better return on investment than off-site alternatives. This is particularly true in areas with high energy or capacity costs and where programs exist such as net metering and solar renewable energy credit incentives. On-site project economics can also be enhanced by selling the renewable energy credits (RECs) produced on site and using the proceeds to purchase lower-cost RECs from off-site projects (also known as "REC arbitrage"). Companies considering on-site generation systems should have an independent party review the on-site project developer's cost and savings estimates, including and especially the assumptions about future utility charges.

Benefits and Challenges of On-Site Renewable Energy

Benefits

- High visibility to stakeholders and public
- Potential for added reliability and resilience, thereby reducing electric utility transmission and distribution costs
- Decreased demand-related utility charges (capacity or resource adequacy charges)
- Participation in grid-interactivity programs providing savings on utility costs
- Arbitrage energy prices to decrease costs or generate extra income
- Tax savings through depreciation and potentially accelerated depreciation

Challenges

- High upfront capital costs, though many financing and ownership structures are available
- Maintenance and operation expenses (unless included in the deal) as well as managing vendors for operations, maintenance, and repair
- Limited space availability; zoning or other restrictions at property
- Very high utility grid interconnection costs in some cases
- Long financing terms (20–30 years) leading to complications with future property sale
- Hard to monetize tax benefits for some real estate firms (especially REITs)

Renewable Purchasing Options

A vast selection of off-site renewable purchasing options exist that accommodate different goals that real estate firms are looking to achieve (see table on following page). This section outlines each off-site option in detail.

Renewable Energy Contracting Options

Renewable energy option	Availability	Implementation	Commitment	Financial structure/risk	Additionality
Renewable energy certificates (RECs)	Applicable everywhere	Simple procurement	Monthly to annual	Addition to retail electric supply contract or separate annual expense	No
Physical power purchase agreement (PPA)	Only in deregulated markets	Request for proposals (RFP) or auction, complex contract negotiations, project development	10–20 years	Fixed price, but potential risk from load/generation mismatch, market settlements	Yes, depending on contract
Virtual power purchase agreement (VPPA)	Applicable everywhere	RFP or auction, complex contract negotiations, project development	10–20 years	Fixed-for-floating swap, involves market risk	Yes, depending on contract
Renewable asset-backed retail contract	Limited; only in some deregulated markets	RFP or auction, supplier contract negotiations	3–10 years	Can be fixed-price contract; PPA incorporated into retail contract; lower risk	Yes, depending on contract
Community solar	Limited; requires enabling regulatory rules	Developer negotiations	10–20 years	Varies by market; usually fixed-price long-term contract/ PPA; potential savings	Potentially
Utility green tariff	Widespread	Simple enrollment	Minimal	Addition to utility bill with an administrative markup	No
Carbon offsets	Applicable everywhere	Simple procurement	Monthly to annual	Separate annual expense	No
On-site generation	Applicable everywhere	Development cycle and project construction	About 25 years	Upfront capital investment with long-term return; can be third-party financed	Yes

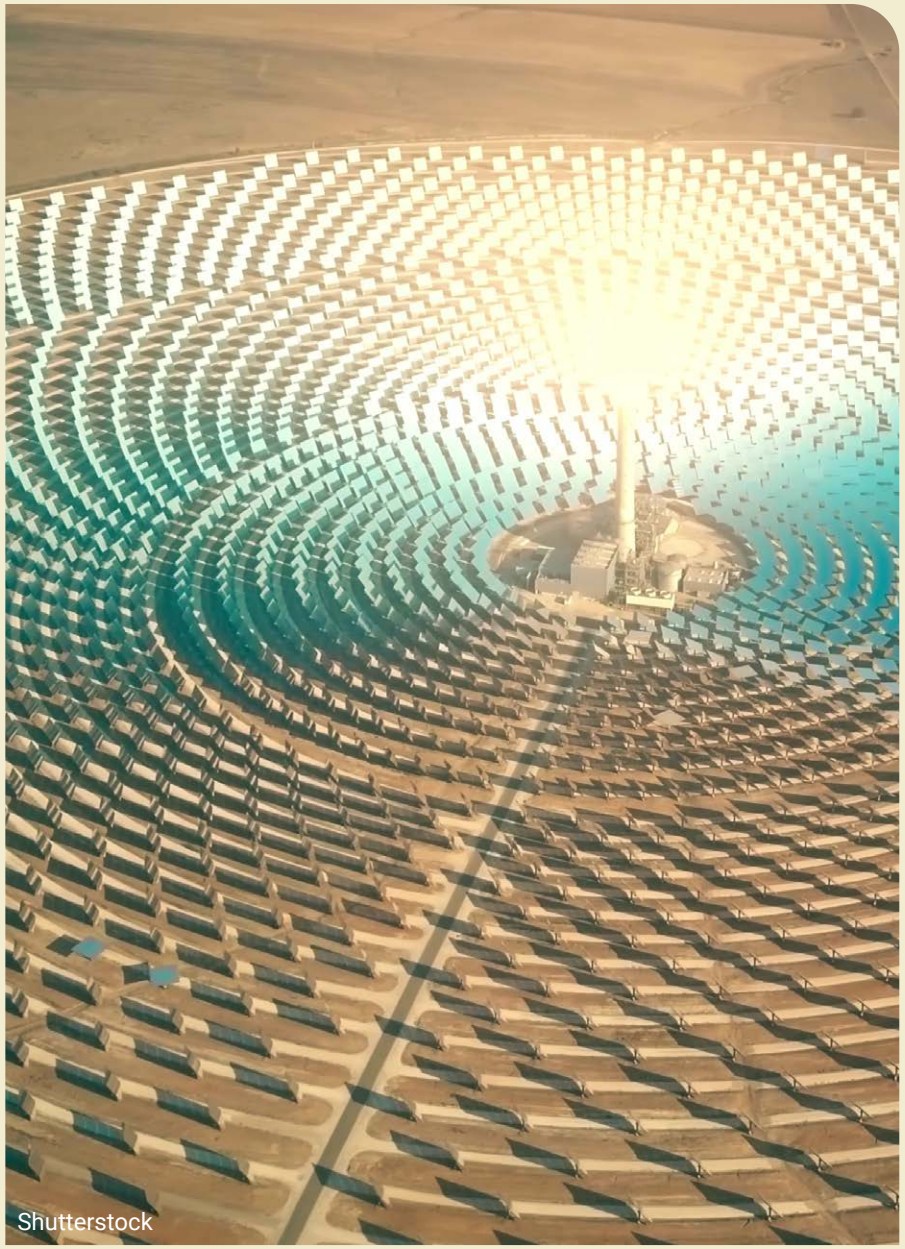
ADDITIONALITY

It is important to consider the quality of renewable energy purchases that support claims for reducing greenhouse gases, one factor of which includes additionality.

Purchasing wholesale RECs from already existing renewable generators does not result in a net decrease in carbon emissions. Consequently, many energy buyers looking for an impact associated with their REC purchases are entering into contracts to source their energy from new renewable generators built to serve their load. This concept of "additionality" signifies procurement of electricity for the organization's or consumer's use that results in newly installed renewable energy capacity that otherwise would not have existed. A key benefit of additionality is the potential to take credit for carbon reductions resulting from the displacement of other generation sources. As stakeholders judge carbon emissions commitments more stringently, more real estate firms are requiring their renewables purchases to have additionality to avoid potential accusations of greenwashing and to future-proof their decarbonization investments.

If additionality is the organization's goal, the best approach for off-site procurement is to enter into a power purchase agreement (PPA) or virtual power purchase agreement (VPPA) directly with a project developer who will develop a specific new project dependent on that new contract. Another option could be to make a direct capital investment in a new renewable generation project.

If additionality is not the goal, more options become available. RECs can be purchased from the market and will likely be sourced from existing renewable generators. Renewable asset-backed retail contracts may be available and supplied from an existing asset. In addition, firms may be able to find an existing renewable generation plant that does not have a contract (referred to as a "merchant plant") that sells its power in the open, often volatile, wholesale market. Often the owners of such plants may sell power on a PPA at a lower price to gain price certainty and may be willing to contract for shorter terms.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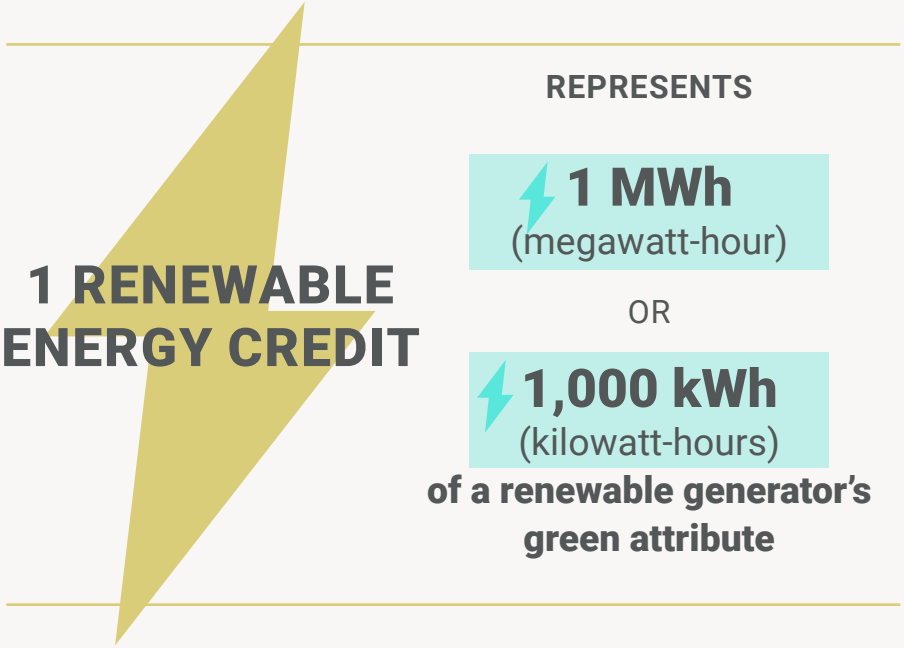
Renewable Energy Credits

Renewable energy credits are available everywhere, involve simple procurement for implementation, have monthly to annual commitments, and are structured either as an extra to a retail electricity supply contract (bundled) or as a separate annual expense (unbundled).

Before exploring renewable energy options, it is important to understand the nuance of RECs as part of the decision-making. A REC is a renewable energy credit that is issued in the form of a certificate that can be a monthly to annual commitment. It represents the renewable attributes of electricity generated from renewable sources and is the foundation for accounting for renewable energy claims. The REC is a separate commodity from the actual electrons that were produced by the generator at the same time.



Buying RECs offers an alternative for real estate owners and developers who either do not have the capacity to or are not interested in generating their own RECs from their own on-site or off-site renewable energy generation. The REC represents verifiable proof that renewable energy was generated, is proof that the REC was purchased by the holder, and legally supports the renewable energy or carbon-reduction accounting/claims the holder may want to make in public.

An organization must purchase or generate and then retire the REC to be able to make a claim to its benefits. It is the process of retiring the REC that prevents double-counting of the benefit. For example:

- If a real estate owner installs and owns solar panels on a roof or carport at its property, but has sold the resulting RECs to another party, that real estate owner cannot make a claim to have used solar energy.
- If a real estate owner leases roof space on its building for an energy company to install solar panels, the building owner or occupant cannot claim the renewable benefits in its carbon accounting. This is true even if the electricity from those panels is being sold to the host building for its use if the RECs are not specifically included in the sale of the electrons.

RECs can be either unbundled or bundled. Unbundled RECs are those sold separately from the underlying energy. These RECs can be purchased at any time from a REC retailer and are relatively inexpensive due to the market surplus. While unbundled RECs can contribute to sustainability goals, the positive environmental impact is less because they do not lead to new renewable energy in the marketplace. In contrast, bundled RECs, those sold with their associated energy, often come from new-build projects and create the opportunity for the buyer to make additionality claims.

Benefits of purchasing RECs:

- Liquid market with many supply options;
- Short-term commitment—can make an unbundled REC purchase in a single transaction;
- Simple contracting;
- Nationwide availability and applicability;
- No utility tariff or legal limitations; and
- Flexibility.

Challenges and issues:

- Typically no transparency to the generation source;
- Cannot obtain additionality through a REC purchase; and
- Short term: no long-term supply commitment or pricing certainty.

Value/Cost of RECs

The value (and cost) of RECs is set by the economics of supply and demand within specific markets, as well as several fundamental characteristics of the particular REC. For example, as of early 2022, RECs in the Washington, D.C., grid are often priced around $400, whereas RECs in Pennsylvania are valued closer to $40. These differences in value are related to the following attributes:

- **Location.** Typically, the more specific the location, the more expensive the REC is. Some RECs are specific to a narrow geography like Zone J in New York City, and others hail from a broader region.
- **Technology.** The source generation type can influence the value of the REC. The following list is ordered from highest to lowest REC value.
  - Solar—Solar RECs are often referred to as "SRECs."
  - Wind—Wind RECs are often cheaper; many consider "wind RECs from Texas" as some of the cheapest in the country.
  - Biofuel (or biomass)—These RECs are often produced from renewable natural gas or biomass, including wood waste, municipal waste, or landfill gas.
  - Hydro—While hydroelectric power is a zero-carbon emission source of energy, typically only "low impact" or "run-of-river" hydro is allowed for creation of RECs.
  - Any source—These are the cheapest RECs available, but the buyer will not know the actual source, thus making it difficult to determine the carbon reduction benefit, if any.
- **Third-party verification/certification.** Certification increases the cost and value of a REC and provides confidence in its legitimacy. Green-e is the most common certification option in the United States.

- **Vintage.** The year the REC was produced, which is relevant when aiming to purchase certificates created during the same period of reporting or electricity consumption.
- **Compliance vs. voluntary.** In many states, utilities and retail energy suppliers are required to purchase set amounts of renewable energy to comply with renewable portfolio standards. RECs meeting compliance standards are typically more expensive.

THE IMPORTANCE OF REC CERTIFICATION

Companies should strongly consider purchasing RECs that are third-party certified. Green-e is the most common certification in North America and is administered by the Center for Resource Solutions. Participants in the Green-e program are audited annually to substantiate product purchases, sales, and claims. Audits are conducted by independent auditors in accordance with established protocols to verify production claims and chain-of-custody tracking.

Green-e will not certify all generation sources. Other certification authorities include the Low Impact Hydropower Institute, which confirms that hydro generation meets a suite of extremely stringent science-based environmental protection standards and social and cultural criteria.

The benefits to using certified RECs are as follows:

- Independent verification confirms the "quality" of the REC and therefore the sustainability claim.
- Verified origination confirms RECs are from a renewable energy source.
- Verified retirement confirms there was no double-counting.

REC Production and Purchasing

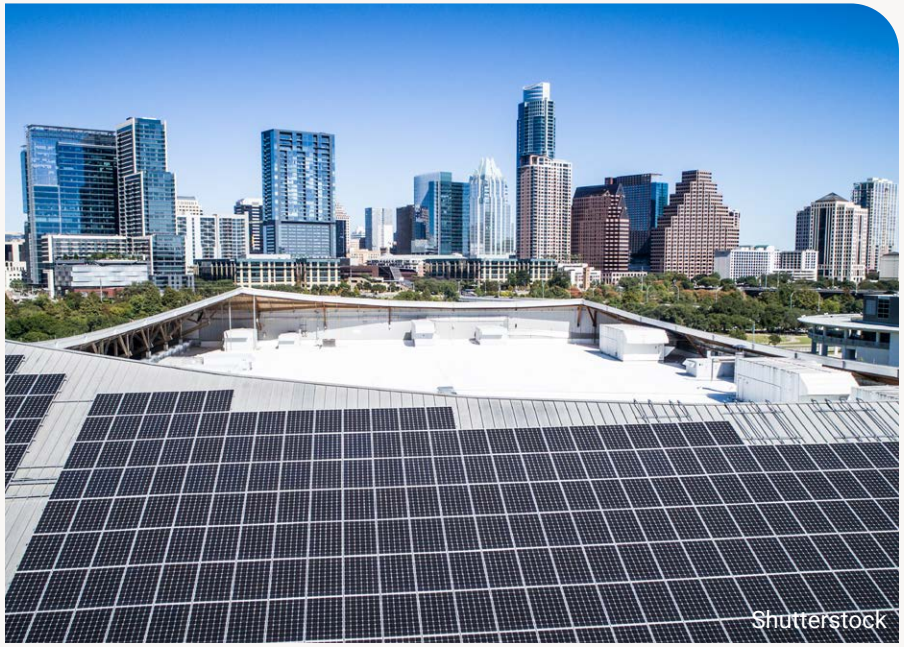
The life cycle of a REC, from its production to retirement, is as follows:

- Renewable system generates electricity.
- The previous month's production is registered on the REC tracking system.
- RECs are created and appear in the generator's REC tracking account.
- RECs are purchased by external stakeholders such as commercial building owners, municipalities, corporate companies, utilities, or other entities seeking to meet specific renewable energy goals/targets.
- Purchased RECs are "retired" so they cannot be claimed by another entity.

RECs are tracked by identification number and registered in a regional tracking system. Tracking systems and processes vary by region. After a REC is sold, the buyer, or someone on its behalf, must record in the regional tracking system that the credit was used and thus "retired." Buyers of RECs can establish their own accounts in the regional tracking system and have the RECs transferred to them for retirement. Alternatively, the supplier of the RECs should be able to retire the RECs on the buyer's behalf.

The vintage of the REC is important. To claim renewable energy was used for a particular calendar year, one must purchase a REC that was generated during that same year, during the six months immediately before (July 1 to December 31) or in the three months immediately following (January 1 to March 31 of the following year).

RECs can be purchased on their own through a number of different brokers and traders. It is also possible to bundle them with electricity supply contracts in competitive markets. In some cases, electric utilities may provide them through optional tariffs or riders.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An example of a utility program is Duke Energy's NC Renewable Energy Program, available to customers in its North Carolina service territory. Under this program, Duke sells blocks of energy produced from renewable sources to a commercial customer. Each block costs $2.50 for 250 kWh, which amounts to $0.01/kWh or $10/REC. This is a simple way for properties in North Carolina to purchase renewable energy, though the price is higher than competitively sourced options.

Retail renewable energy suppliers in competitive markets can add RECs to their supply contracts with pricing based on market prices. As of mid-2022, REC additions on such contracts were priced at $5/REC or $0.005/kWh for wind-produced RECs.

If a firm is purchasing renewable energy through a different product structure, like a PPA or by installing on-site renewables, and wants to make a claim that it is purchasing renewable energy, the REC must be transferred to the firm as part of that sale.

A misconception commonly held by many renewable energy buyers is that greening their energy portfolio is going to be prohibitively expensive; however, it does not have to be. Prices have been increasing recently, but renewable energy purchasers have been able to buy RECs for under a penny per kWh. For example, a 260,000-square-foot building using 3 million kWh per year can buy wind energy RECs for less than $15,000/year (at June 2022 wind REC prices).

Power Purchase Agreements

PPAs are contracts for the purchase and sale of renewable electric power, available in two main types: physical PPAs and virtual PPAs. These contracts have a typical commitment of 10 to 20 years. In this context, PPAs are for the direct sale of power by renewable energy producers/generators to an end-user of electricity.

Unlike with typical REC purchases, PPAs can provide direct visibility to know what specific generator was used to produce the power, the transparency of which many buyers value. PPAs also allow a corporate buyer to contract directly with the producer of the new renewable energy generation to be developed specifically for that contract, which ensures additionality of the power.

Physical Power Purchase Agreements

Physical PPAs are available only in deregulated utility markets. They are implemented through an RFP or auction process and require complex contract negotiations as well as a waiting period for the project development. The commitment has a relatively long term of 10–20 years with a fixed price for the power, but it also has potential risk from load/generation mismatch and market settlements.

Physical PPAs are direct contracts for the sale of physical power between a renewable developer and a customer. With these contracts, the customer is buying the actual electrical output from specific generating facilities. As the physical buyer, or "offtaker," of the generated power, the buyer is receiving the energy as it is produced. The customer must arrange for power to be transmitted (or "wheeled") from a designated delivery point across the grid to the customer's load meter. Ownership (title) is passed to the customer at the delivery point.

The customer will receive the energy at the same time it is produced. However, the output of the generator in almost all cases will not match the consumption at the load meter on an instantaneous basis. Therefore, the buyer will need to purchase additional power from the market or other sources. If excess renewable energy is produced that cannot be consumed by the offtaker, that power must be sold into the market. This is one area where risk is introduced to the buyer's budget. The seller may be willing to provide "firm" or "load following" power, but it will come at an additional price.

Operational factors. Because the customer will usually take ownership of the PPA electricity at a point on the grid away from the customer's utility meter at its facility, there are certain wholesale operational functions that the customer must perform or arrange for someone else to perform on the buyer's behalf. These functions include generation and usage forecasting, power scheduling, wholesale settlements to ensure the scheduled generation and load are balanced with the actual and imbalances paid for, 24-hour dispatch, and reporting. Most corporate buyers will contract with an entity that is a registered wholesale market participant that performs these functions and processes.

Collateral. Wholesale participation typically also requires posting of collateral to the grid operator and sometimes the state or local utilities or regulators and the PPA seller, which needs to be taken into account in the economic analysis of the PPA.

Variable energy production. The physical PPA contracts are tied to a specific generating plant. Typically, the contract will state that the buyer will receive the energy "as produced," meaning the customer bears the risk for taking however much or little the facility produces. "Unit contingent" is a similar structure whereby the production is contingent on the operation of the generators. The contract may have some form of production guarantees. Another potential option is a "firm" contract whereby the seller is responsible to provide power whether the generator is producing or not with financial penalties (called "liquidated damages") owed by the supplier if it fails to deliver.

Benefits:

- Able to contract for additionality.
- Physical delivery means the generation will likely be close to the properties, a concept called "locality."
- Contracting is with a specific generator.
- Has more budget certainty compared with a VPPA.

Challenges and limitations:

- Properties have to be in deregulated states.
- Contracts are typically long term (10 to 20 years).
- Physical delivery of energy requires contracting for someone to do the wholesale power delivery functions, like forecasting, scheduling, dispatch, and settlements (higher expense).
- Means less flexibility when selling properties under contract (see contracting sections for more details).

Virtual Power Purchase Agreements

VPPAs are applicable in every market. They are implemented through an RFP or auction process and require complex contract negotiations as well as a waiting period for the project development. The commitment is 10–20 years and has a fixed-for-floating swap financial structure, which involves market risk.

Closely related to physical PPAs, VPPAs are similar but with several key differences and potential advantages. Like physical PPAs, VPPAs are contracts directly with power generators for the output of the generator. What makes a VPPA "virtual" is that the actual power does not physically flow from the generator to the buyer; rather, the contract is financially settled. The VPPA is entirely independent of the physical supply.

A VPPA is a type of contract known as a "contract-for-differences." Instead of scheduling the power to flow, the generator and customer sell or buy power on the market separately and settle for the price differences. The two parties agree to a fixed contract price, each separately buys or sells power in the spot market at market prices, and then they reconcile the differences financially. These contracts typically have a commitment of 10 to 20 years.

With a VPPA, first a fixed contract price is locked ("strike price") and a delivery point is defined. Then, the producer sells power to the grid at the market price (typically hourly real-time locational marginal price—the wholesale electric energy price at a specific grid location, like a generator connection point or a substation) at the delivery point as posted by the grid operator. Then the settlement process occurs; if the market price at the delivery point is higher than the strike price, the producer pays the buyer the difference; if the market price at the delivery point is lower than the strike price, the buyer pays the producer the difference. The buyer will continue to purchase physical power to serve its load in conventional ways. That may include making purchases from retail energy suppliers in competitive-choice markets or from the local utility.

The delivery point for the contract is a point of negotiation. Examples include the interconnection point for the generator, which may be referred to as the generator's "node," or at a regional trading "hub" where bulk power is bought and sold. The node price may be more volatile than a hub price because of the higher volume of trading at a hub. The price difference between a node and a hub is referred to as "basis," and the risk that prices at the node and hub diverge is known as "basis risk." The developer will likely want the delivery point to be its generator node to reduce its basis risk. Evaluation of the history of the node and hub prices and forward-looking estimates should form a part of the analysis for any VPPA contract.

VPPAs have several benefits over physical PPAs:

- Physical delivery of electrons is not required; therefore, VPPAs can be used anywhere, even to "supply" energy users in regulated, vertically integrated utility territories.
- The settlements can be assigned across a large number of facilities more easily, making it accessible to portfolios of properties or chains of smaller stores or restaurants.
- VPPAs have less operational complication since the wholesale electrical market functions are not required.

Disadvantages of a VPPA are that it can introduce more budget risks than a physical PPA:

- VPPAs can introduce budget risks unless properly managed because the buyer is providing the seller a fixed price while the buyer is *accepting the floating price risk*.
- In a period of a prolonged energy price slump, the VPPA buyer could have to pay a lot of money in settlements. (In a rising market, the buyer would be paid in that settlement process, potentially resulting in budgetary savings.)

VPPAs have important accounting considerations since they are financial transactions. U.S. generally accepted accounting principles (GAAP) and International Financial Reporting Standards (IFRS) rules treat VPPAs differently. IFRS requires mark-to-market (MTM) accounting of the contracts whereas GAAP does not. MTM accounting could introduce unexpected paper losses in financial reporting. A real estate company's accounting department, auditors, and executive team should be involved early in the process of selecting a renewable energy contracting structure to ensure buy-in and help with evaluation.

Renewable Asset-Backed Retail Contracts

Renewable asset-backed retail contracts have limited availability in only some deregulated markets. They are implemented through an RFP or auction process and involve supplier contract negotiations. The commitment ranges from three to 10 years, and the financial structure is lower risk because it can be a fixed-price contract, a PPA incorporated into a retail contract.

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Renewable asset-backed retail contracts are available only in markets where customers have a choice of who supplies their electricity. In this type of product, a retail supplier enters into a PPA from a specific renewable energy generator and signs contracts with one or more of the supplier's retail customers for a portion or "slice" of that PPA. The energy supply is managed by the retail energy supplier that provides all the customers' electricity requirements on a firm basis. The commitment to this type of contract ranges from three to 10 years.

The benefits to buyers include the following:

- Simpler contracts very similar to typical retail "standard-power" agreements. With some suppliers, the difference may be only a paragraph of additional language.
- Shorter terms more typical of retail deals (three to 10 years).
- More flexibility, especially if the buyer's property may be sold in the future.
- Eliminates a lot of the risks that PPAs and VPPAs place on the buyer.
- Includes visibility and traceability directly to a renewable energy project.

Disadvantages of a renewable asset-backed retail contract:

- May not include additionality.
- Price likely to be higher than a PPA or VPPA.
- Only available in deregulated (or direct access) states and may be limited even in those.

Community Solar

Community solar has limited availability, because it requires enabling regulatory rules in a market. It is implemented through developer negotiations and may require a commitment of 10–20 years. The financial structure varies by market, could require a fixed-price long-term contract/PPA, but includes potential financial savings compared to retail rates. However, most programs do not convey the REC to the buyer, so the buyer cannot claim the renewable energy purchase or carbon reduction.

Community solar is another way to buy renewable energy from an off-site generator and is coordinated with the local utility. Community solar programs were created to provide small energy consumers access to solar power. The programs also provide a significant savings, typically 5 to 10 percent or more, over retail electric bills. Community solar provides a means to access solar power without the need to invest in solar panels at a property or if a building does not have enough unshaded space for panels. This could be a good solution for small tenants of a larger building with triple-net leases and may require no term commitment at all for small users, like many tenants.

Consumers who sign up for community solar are referred to as "subscribers." Depending on the local laws or rules, subscribers may be individual residential homeowners and renters, and small businesses, including individual tenants in properties where utilities directly bill the tenants. Customer size limits usually apply.

Some states and utilities allow larger businesses to participate as "anchor subscribers." Anchor subscribers are large commercial customers, like commercial properties, tenants, or hotels, that can contract for up to half the community solar project's generation. The anchor contracts are structured like PPAs and typically are for 10- to 20-year terms.

The general process for community solar works as follows:

- Solar developer gets approval to build a community solar farm.
- Solar developer signs up "subscribers" to take a share of the output.
- The local utility purchases the physical energy and RECs from the community solar project.
- The utility credits the subscribers for their share of the solar output on the utility invoice.
- The subscriber only receives utility bill energy credits, not the actual electrons or RECs.
- The solar developer invoices the subscriber for its share of the output, usually at 80 to 95 percent of the credit paid by the utility, thus creating savings to the subscriber.

As of December 2020, 22 states plus Washington, D.C., have policies that support community solar, according to the National Renewable Energy Laboratory. Rules vary greatly by state and even by utility, so interested parties should contact the utility, a solar developer working locally, or an energy consultant for detailed information on the opportunities for their buildings.

Real estate owners may be able to participate in these programs by

- Signing up small building or tenant meters as subscribers;
- Hosting a community solar project by leasing land or roof space at their property;
- Partnering with a solar developer to sign up tenants for the solar power, especially for residential properties; and
- Contracting a larger property tenant as an anchor subscriber.

A very important element to note for community solar is that the subscribers in most cases do not receive the RECs and therefore cannot formally claim to be purchasing renewable energy, nor can they claim the solar energy purchase on their zero-carbon emission attributions in most reporting regimes. One strategy a community solar subscriber can use is to take the savings from the community solar utility bill credits and use them to purchase RECs from another source. In that way, the subscriber could reduce the overall cost impact of purchasing renewable energy.

Benefits:

- Provides a savings on the electric bill.
- Contracts with a local solar field.
- Can be used to show local community support.
- Tenants may be able to participate and save.

Challenges and issues:

- Subscriber does not receive REC so cannot use community solar contract to support sustainability claims.
- Contracts for larger electric accounts may be long term: 10 to 20 years for anchor subscribers or properties that host community solar on the roof.

NET METERING

Some states also offer a net metering program that allows consumers that generate electricity to receive credit. This allows usage from a solar project located on site or off site to offset a property's usage through utility invoicing. The benefit of these programs is that the solar can offset energy consumption or spend without having to match the load to production on an hourly basis. In some cases, the entire utility bill can be negated. For the states that participate in net metering, there are three main types:

- The most common program is virtual net metering. This program distributes utility energy bill credits to consumers of a community or other off-site solar project. For example, if a subscriber to a solar farm owned 10 percent of the panels, then it would be credited 10 percent of the production. These credits would automatically appear on its electricity bill, lowering the cost of utilities.
- Other states have aggregate net metering. This allows a single customer to offset electrical uses from several different meters on the consumer's property via a single renewable energy generating system. In some areas, the aggregation could include tenant meters.
- Only in New York state, nonresidential customers can take advantage of remote net metering. Customers with renewable generating equipment at one location can use the excess electricity generated to create credit that can offset other electric accounts.

Carbon Offsets

Carbon offsets have widespread availability, involve simple procurement for implementation, have monthly to annual commitments, and are structured as a separate annual expense.

Carbon offsets are credits that can be purchased that represent a reduction in carbon dioxide or greenhouse gas emissions and can be used to offset the carbon from Scope 1, 2, or 3 emissions. The credits are produced by companies that have reduced their carbon emissions or taken other actions to reduce carbon dioxide in the atmosphere. By purchasing carbon offsets, buyers can offset their own unavoidable carbon emissions from burning natural gas or other fossil fuels (whereas buying RECs is more focused on offsetting emissions from electricity use, since the renewable energy generated is typically electricity).

Benefits of carbon offsets include the following:

- Low-cost alternative allowing businesses to offset emissions;
- Contribution to emission reduction projects; and
- Offsets to Scope 1 emissions from natural gas/propane/fuel oil or vehicle emissions that other renewable energy electricity solutions cannot address.

Carbon offset credits may also be purchased from projects designed to remove carbon dioxide from the atmosphere, such as reforestation, not cutting down trees, or changes to agricultural practices. Some companies are making direct investments in efforts like these and receive carbon offset credits in exchange.

Real estate firms should carefully review the guidelines of any reporting standard they are committed to using to determine how the standard regards carbon offsets. As stakeholder interest and pressure increase for decarbonization, some entities are excluding carbon offsets from net zero definitions. For example, the U.S. Department of Energy's Better Climate Challenge specifies that organizations must meet its 50 percent carbon emissions reduction target without using carbon offsets.

Traditional Utility Green Tariff Options

Utility green tariffs have widespread availability and are implemented through simple enrollment with the utility. The time commitment is minimal and is structured financially as an extra to the utility bill with an administrative markup.

Part of any review of renewable options should include researching the offerings of the local utility. Utilities are territory specific, and as such the offerings vary by utility and state. In many U.S. markets, electric utilities themselves offer renewable energy products as optional green tariffs or special programs available to their customers. For traditional vertically integrated and fully regulated utilities, their programs are typically structured, standardized, and feature pricing approved by their regulator with little or no room for flexibility or negotiation. In some states, particularly California, community choice aggregation programs available in some cities also offer renewable electricity supply.

A typical utility renewable energy program includes renewable rate or tariff options. Many utilities offer customers the option to add renewable energy purchases to their standard rates. These typically are in the form of RECs. Many of these are relatively low-cost options. Some utilities offer different packages at different subscription levels, like 50 percent or 100 percent coverage of a building's usage. These options typically have a minimal commitment period.

Benefits of traditional utility green power include the following:

- Many are very flexible by allowing cancellation at any time and are directly on a utility bill.
- Tenants can easily sign up, and if they are sharing their utility bills with landlords, owners can take some credit for Scope 3 (tenant's Scope 2) reductions.

Disadvantages include:

- The administrative fees put on these products by the utilities often make them a higher-cost, less-competitive option.
- Challenges exist in how the utility tracks, verifies, and reports on these RECs to consumers.


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Detailed Process for Procuring Off-Site Renewables

To procure off-site renewable energy, a number of priorities need to be set and decisions made regarding the type of product to contract for, volumes, type of technology, term length, counterparty, and other important elements along the way. The off-site renewables procurement process is summarized in the graphic on the following page. This section's detailed explanations will help a potential off-site renewables buyer identify those decisions and understand potential limitations.

Real Estate Buyer's Guide for Procuring Off-Site Renewables

Strategize for the Procurement Process

Set goals and expectations early on to understand how procuring off-site renewables will be a part of the strategy at property, portfolio, and firm levels. Determine priorities and timelines to help narrow what renewables options are the best fit. Consider the organization's environmental, social, and governance (ESG) goals and frameworks, including how the initiatives view different off-site renewables options. Strategies should incorporate regional context as well, since it can affect renewables options.

Set the Plan in Motion

Assemble a diversified team of internal and external experts who can provide valuable feedback on the different parts of the procurement process. The team then can proceed with deciding what type of negotiation or bidding process they want to pursue. Then, the team will pick what vendors to solicit: brokers, suppliers, and/or developers. Following solicitation, the organization should determine the volume to procure and the timeline.

Evaluate and Decide

Conduct the procurement process and evaluate bids while considering appropriate contract terms and risks. Consider future pricing risks that could affect the contract. In addition, consider the credibility of the broker, supplier, and developer. This should include comparing the availability of the power each seller is offering.

Execute the Deal

Carefully review and negotiate the contract for all nuances and specifics that could affect the organization's goals and expectations. For real estate, it is particularly important to pay attention to the tax and disposition implications, in addition to management of downside risk. Consider how current or future tenants could be affected by this decision.

Develop the Procurement Process Strategy

Energy efficiency efforts should be the first steps taken before developing a strategy to procure renewable energy because reducing overall consumption means less renewable energy needs to be procured. After energy efficiency measures are completed, a renewable energy strategy can be optimized.

Understanding and documenting a company's renewable energy strategy is the first step to procuring off-site renewables. There are a number of viable reasons for pursuing a renewable energy purchase: regulatory compliance, government mandates, corporate valuation, financial economics, and industry targets. Collecting and documenting the organization's goals and positions on these topics is necessary to develop an off-site renewables purchasing plan.

Following are some questions to consider internally when building out a company's procurement strategy:

- ***Why is the organization purchasing renewable energy?*** Motivating factors could include regulatory compliance, tenant demand, employee engagement, investor demand, community interest, or brand image.
- ***What are the organization's goals?*** Understanding internal corporate objectives and sustainability goals upfront is important in ensuring that the decisions made are aligned.
- ***What emissions are targeted?*** Renewable energy purchases by real estate owners and managers typically target Scope 2 emissions—those emissions associated with the electricity generation to supply the landlord-controlled spaces and systems. Some companies have also specifically included Scope 3 emissions—those associated with tenant-controlled energy use and, with respect to renewable energy, tenant electricity use.
- ***What will success look like, and how will it be measured? Is there a time frame established for achieving the goals?*** Aligning internal corporate goals and realistic renewable energy timelines is critical to a project's success.
- ***How will the results be publicized?*** Many companies use a press release, corporate sustainability report, or other public means to communicate the success of a renewable energy initiative.
- ***Are there regulatory or voluntary reporting requirements?*** Understanding the mandatory and voluntary reporting requirements when strategizing on renewable energy will come in handy both during and after project installation.

Emissions Inventory

Before beginning the process for any renewable energy procurement, the first step is making a comprehensive review to catalog and measure the existing emissions the company is trying to eliminate or offset. Work internally or with a contractor or consultant to do a thorough and accurate analysis of the emissions from all company properties and activities. This should include Scope 1, 2, and 3 emissions. Document these and initiate a tracking process to update and report on the emissions in the future. A reporting process will be necessary to show progress as future solutions are deployed. Knowing the current emissions inventory will also be necessary to properly size a renewable energy purchase.

Current best practice is to use the U.S. Environmental Protection Agency's eGRID factors to determine the emissions of the current power supply generation mix supplying the properties in question or other business activities the company wishes to cover. Usually this is the conventional power grid, and the emissions are from the burning of coal, natural gas, or oil for the production of electricity.

Renewable energy generated from wind or solar has effectively zero emissions (disregarding the emissions to manufacture the equipment and construct the project). Therefore, the greenhouse gas reductions would be the difference between the emissions associated with the power generation sources before the renewable energy purchase and the new emissions levels from the renewable generation under the contract.

Portfolio- versus Property-Level Strategies

At a basic level, action on carbon reduction for real estate starts at the property. Reductions in energy intensity and consumption or installation of on-site energy projects are all property-level initiatives. However, when it comes to off-site renewable energy purchasing, a portfolio approach may be considered for scale.

Cost benefits are possible when aggregating multiple properties for the purchase of off-site renewables. Transaction costs for renewable energy purchases tend to be relatively fixed regardless of the volume, so higher-volume trades reduce the overall cost. Given the size of most utility-scale, off-site renewables projects, a single property is unlikely to be large enough to enter into a PPA, for example. Simpler off-site renewable energy purchases at the property level could be for RECs, carbon offsets, or utility green power.

If all the properties in a portfolio are supplied by the same electric grid or region, a physical PPA may be applicable. Organizations may be able to aggregate at a much larger regional geographic scale, such as an entire North American or European portfolio, using a VPPA since that option does not require a physical delivery of the power and the contract settlements can be allocated proportionally across assets in the portfolio.

For reporting purposes, a firm may have to assign or allocate the purchased renewable energy and resulting carbon and emissions reductions to individual properties as opposed to a collective portfolio, so data collection and reporting systems remain critical considerations.

Prioritizing efforts across a portfolio is a valuable part of the strategy. Benchmarking carbon emissions of assets and the electricity they are using can help target "low-hanging fruit," also known as bigger impact opportunities. If a real estate firm needs to prioritize efforts, it can determine which properties are in regions with higher emissions from the grid in general, as these territories will give an organization the biggest bang for the buck in terms of lowering Scope 2 emissions. Some firms choose to target highest-priority renewable energy purchases for properties with relatively high Scope 2 emissions totals and higher energy intensity. In general, the activities that need to occur, many of which can and should overlap, are as follows:

- Assess the carbon footprint of each property in the portfolio.
- Assess the opportunities, costs, and improvements for energy or carbon reduction efforts for each site through energy efficiency.
- Prioritize and assign capital outlays and schedule. In most cases, these efforts take place across years.
- Identify where off-site renewables can bridge the gap and provide near-term improvements.
- Assess the opportunities and possibilities for off-site renewable purchases for each property, region, or portfolio.
- Stage the off-site renewables purchases.

Setting Priorities and Timelines

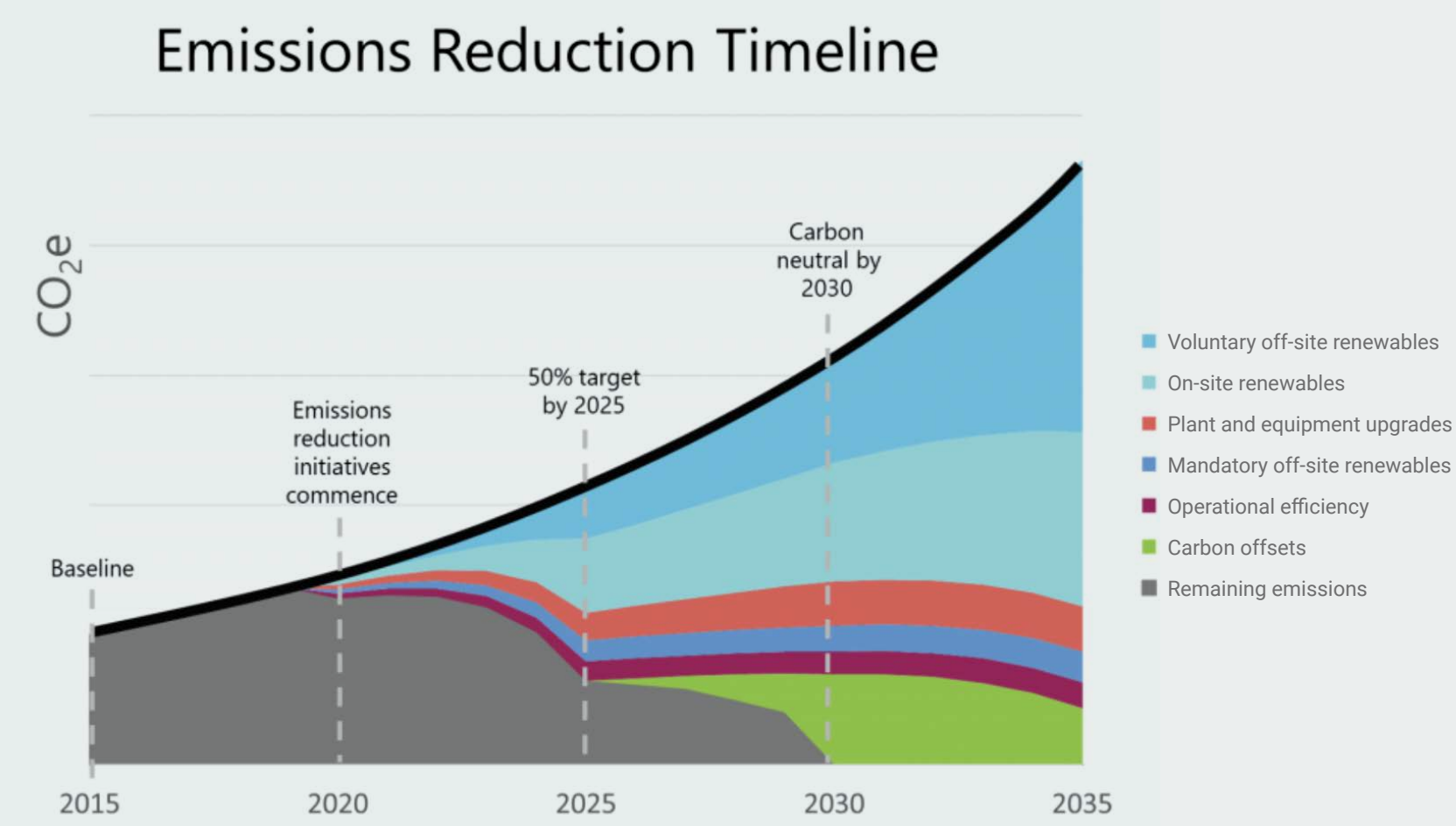
The road map to renewable energy or carbon reduction goals for a real estate firm will likely stretch over years. A strategy should be documented that identifies what actions will be taken and when: see the figures (below) for sample pathways and timelines to achieve carbon reduction goals. For example, a PPA may make sense for all or most of the portfolio, but it may take years to negotiate and build out generating facilities. In the short term, other options like RECs or a renewable retail electric contract through the local utility or energy supplier may be available under short-term contracts that bridge the gap to the ultimate solution.

Lendlease's Five Steps provides an example of how one real estate firm is strategizing its road map for a decarbonization path to net zero with a phased approach to off-site renewables. Lendlease set a target to be a 1.5°C aligned company, which means it will achieve the following: net zero carbon by 2025 for Scope 1 emissions, produced directly from the fuels it burns, and Scope 2 emissions from the power it consumes; and absolute zero carbon by 2040, eliminating all emissions, including Scope 3 emissions generated indirectly from activities, without the use of offsets.

Lendlease's Five Steps to Decarbonize Its Global Business

Source: Lendlease, www.lendlease.com/better-places/roadmap-to-absolute-zero-carbon/-/media/fa3122e752024a22b1e61bc08bf8972a.ashx.

Sample Real Estate Carbon Emissions Reduction Goals, Strategy, and Timeline



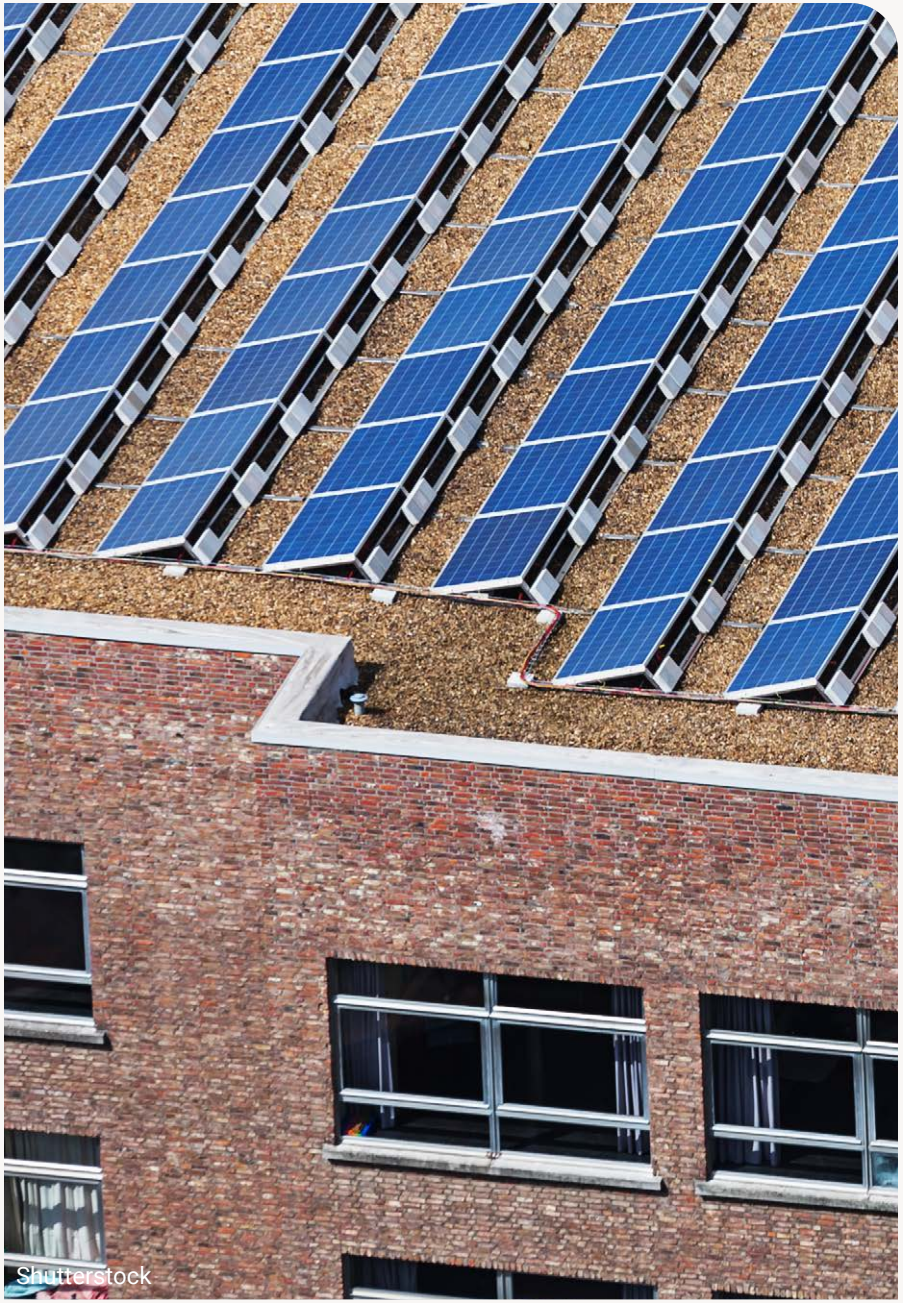
Source: GRESB, https://gresb.com/pathway-to-carbon-reduction/.

Renewable Energy in ESG Commitments and Reporting

A number of voluntary sustainability and ESG initiatives exist for organizations to commit to and report against certain targets, such as RE100 and the World Green Building Council's Net Zero Goal. Some include scoring mechanisms that help investors and other stakeholders compare organizations and ESG achievements, such as GRESB and CDP (an international nonprofit that helps companies and cities disclose their environmental impact). If an organization is signed onto one, it should understand the commitments and the data reporting requirements as they pertain to renewable energy efforts. Consultants can assist in the tracking and reporting efforts.

Data is critical for successful renewable energy reporting on ESG commitments. It is important to understand how data from off-site renewable energy suppliers is funneled into these databases. Automated data delivery into RFPs and contracts is a great way to streamline the data acquisition and reporting process.

It is critically important to verify that the renewable energy contract a company enters will support the claims to which the organization has committed. Confirm with the company sustainability consultants or carbon auditors that the supply contract for off-site renewables is of the right type, is for the right volumes, and carries the appropriate certifications to count within the framework being used. Not doing so could result in an unpleasant surprise in the future.



Government Incentives and Regulations

National, regional, state, and even local governments have been providing financial support and incentives for renewable energy for decades. This support may come in the form of tax credits, grants, or policies to encourage or laws that require the use of renewable energy. Government incentives have a significant impact on the pricing and availability of renewable energy, whether produced off site or on site.

The most significant government incentives for renewable energy are in the area of tax credits and rebates. Investment or production tax credits and accelerated depreciation are the most significant. However, for incentives to have value, the owner of the generation asset must have a tax liability. In many cases, real estate owners have already negated tax liability on corporate earnings (for instance, in a REIT structure). Entering a PPA with a generation owner that has tax credit appetite allows such a real estate buyer to get the advantage of these tax credits through contract prices. Some investors are also interested in purchasing those tax benefits through what is known as tax equity financing, which renewable asset developers can arrange. In the United States, as of early 2022, the Biden administration has proposed bills increasing and extending these incentives as well as adding a host of other changes to encourage renewable energy and energy efficiency.

Regulatory expectations for ESG transparency are growing: in March 2021, the European Union implemented strict ESG reporting guidelines for investment portfolios, and the U.S. Securities and Exchange Commission announced proposed reporting standards in May 2022.

Many cities are enacting local laws to mandate renewable energy purchasing and energy efficiency through building performance standards and other legislative tools. New York City, Philadelphia, Washington, D.C., and San Francisco are just some of the cities with these laws and mandates. Be sure to check the local regulations for compliance requirements.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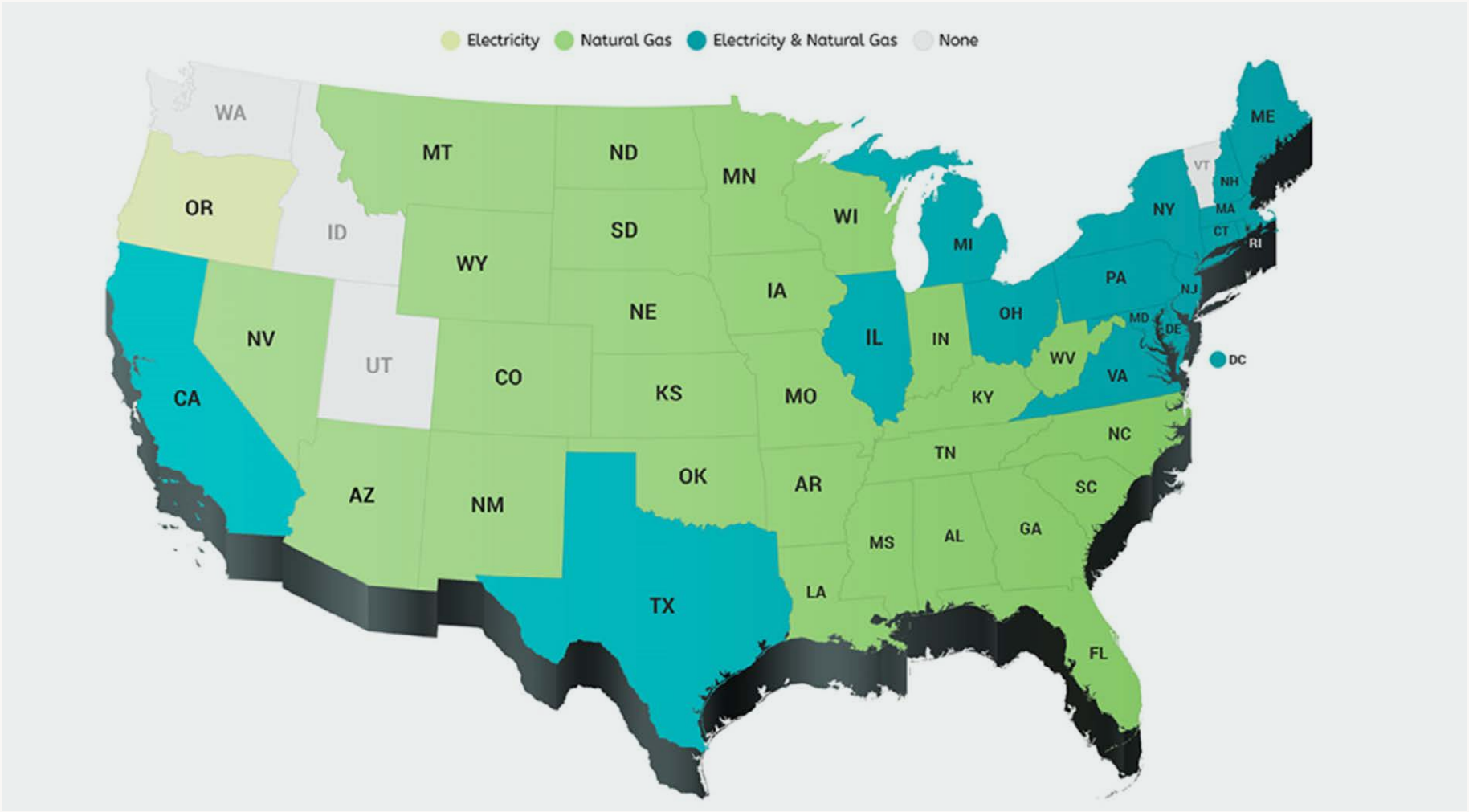
Utility Regulatory and Legal Constraints

The options for purchasing off-site renewables may be limited by the laws and regulations governing the portfolio area, or by the rules and tariffs of the electric utility controlling the applicable grid (see figures below and on page 35).

Deregulated States and Applicability of Off-Site Renewable Energy Contracts



Source: Transparent Energy.

Breakout of Off-Site Renewable Types by Geographic Availability

Off-site renewable type	Geographic availability
RECs, VPPAs, carbon offsets	All
PPAs, renewable-backed retail	CA*, CT, DC, DE, IL, MA, MD, ME, MI*, NH, NJ, NY, OH, OR*, PA, RI, TX, VA*
Community solar	AZ, CA, CO, CT, DC, DE, FL, HI, IL, MA, MD, ME, MN, NC, NH, NJ, NM, NV, NY, OR, SC, WA. Likely future programs (2022): PA, VA, NM

Source: Transparent Energy.

* Supplier choice limited by law or regulation.

Open or liberalized markets (deregulated): Eighteen states and the District of Columbia allow customers to shop for electricity from a supplier other than the local utility. That covers about 70 percent of the consumers and businesses in the United States because most major markets allow this choice. These markets with liberalized energy supply allow for all the options listed in the figures.

Regulated markets: In other areas without retail supply choice, the utilities are typically vertically integrated (the utility owns the distribution system and power generation) and the options are more limited. In these areas, utility providers may offer renewable energy options under their tariffs. In these markets, the distribution grid is closed to use by any entity other than the utility that owns it, so physical supply options are not available. However, organizations can still enter into agreements that do not require a physical delivery of energy, such as VPPAs, stand-alone RECs, or carbon offset contracts.

Contracting Constraints

Different off-site renewable options have different contracting requirements.

PPAs and VPPAs, especially those contracted with new projects to attain additionality, generally require long-term commitments. The ability of an organization to approve these term lengths is something that should be considered up front in the process of selecting off-site contract types. For real estate portfolios that hold properties for shorter durations, the long-term PPA deal lengths can complicate the decision-making. VPPAs, by their nature as financial not physical transactions, do not have to be tied to specific properties and therefore may be a better choice for real estate portfolios. Since the VPPA does not have to be directly tied to individual properties, a real estate portfolio is free to remove or add properties without affecting the VPPA contract, making it a more flexible option, and ideal for shorter-term property holding strategies.

A renewable asset-backed retail contract may be a better choice in deregulated markets to potentially avoid the term length of PPAs and achieve a shorter contract term. In those cases, the retail supplier enters the PPA with the generator. These suppliers are often willing to sell shorter-term contracts from the asset with the assumption that they can renew that contract in the future or find an alternate customer to take that supply for the remainder of the PPA's term.

Utility green tariff contracts are very utility specific. Some utilities offer robust programs while many offer no green options at all. Check with the local utility's commercial account team for options available in the area and for the specific rate classes for the affected properties. Review the filed tariff, pricing history (if variable), and any required agreements for the program. It is very unlikely that changes to the tariff or agreement can be negotiated due to regulatory oversight, but it is important to understand the rules and limitations governing the programs.

Community solar programs are created through laws and regulations in certain states. Program availability, structures, eligibility limitations, and savings vary greatly by state and even by utility within a state. Be sure to understand the options and restrictions in the area where the company's property is located. An expert consultant can be valuable in evaluating options.

RECs and carbon offsets are commercial contracts and not restricted by local utility law and regulation. Unbundled RECs or carbon offsets can be purchased for properties anywhere in the country. For properties in regulated energy markets, the retail electricity or gas supplier may have options to add RECs to the company's electric contract or carbon offsets to its gas supply agreement. These can be effective and potentially inexpensive ways to add renewable energy to the company's supply portfolio.

Geographic Reach

Power source geographic limits for a company's off-site renewable energy purchases are important to understand. These limits are often defined by the sustainability compliance platform selected and may, for example, limit the location of any renewable generation to the territory of the electrical grid supplying the company's properties. Other buyers consider the entire United States as a "region" for allowed purchases of renewables. Be sure to consult the company's carbon auditors or sustainability consultants to verify any such limitations.

The choice of a local contract versus one geographically farther away may also have public or shareholder relations or political implications. A local project may feel more tangible to employees and tenants and may contribute to local job creation. However, a local project may be more expensive than one located in a more distant, more rural area, where land is cheaper and more readily available. Many buyers will now consider these "societal benefits" of a project as decision criteria.

Real estate firms can analyze which renewable generation technologies are applicable, recognizing geographic constraints, strategy, and reporting scheme limits (if applicable). Land use laws, land constraints, government incentives, and the natural resources themselves vary across geographies and political regions and will influence the types of renewable technologies that may be available.

Renewable Generation Technology

The type of renewable energy should also be considered. Most people consider solar and wind to be the best renewable generation options because they have zero emissions. Hydropower is also a zero-emission source, but it is considered less desirable because of the habitat destruction and other impacts on land and wildlife caused by dams.

Biofuel sources are also considered renewable by many, but they still involve burning a fuel (albeit a renewable-source fuel), which results in atmospheric emissions. Consequently biofuel is a less desirable renewable energy source with lower carbon reduction credit. The potentially negative perceptions of hydro and biofuel renewables should be taken into consideration when choosing a renewable generation source.

Prices and Budget Constraints

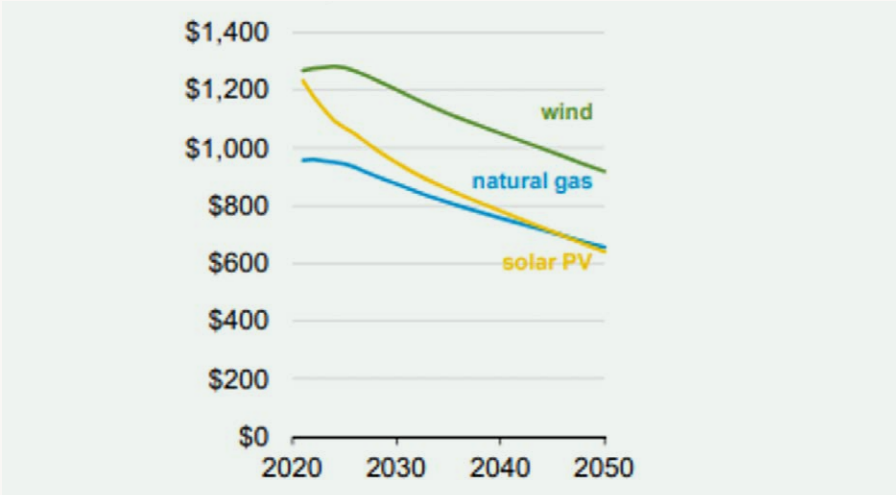
Budget constraints may limit an organization's options for the types of contracts or technologies available. Renewable energy is generally more expensive than traditional "brown" power, though localized costs for renewable energy vary widely. Some questions real estate owners and investors should ask include the following:

- Is there additional funding for a renewable energy premium?
- Will the extra funds come from the existing operating budget for each facility?
- Does the renewable energy project garner higher rents or higher occupancies?
- Could capital be made available for a direct investment in off-site wind or solar?

State and federal tax incentives and grants affect the price of renewable energy. The amount of renewable energy generation varies regionally, and areas with more supply relative to demand will see lower prices. Areas with more sun, like the southwestern United States, or more wind, like the U.S. central plains, will also have lower costs for renewable energy.

Different types of renewable generation may be available and of interest and within the buyer's geography and budget. Currently, the installed cost per kW of solar is slightly below that of wind (see figure). Both costs are expected to fall over the next 30 years, with solar decreasing faster than wind. The installed cost of combined-cycle natural gas is 25 percent lower per kW than wind and solar now, but solar photovoltaic (PV) is expected to catch up to it by the mid-2040s. Bear in mind that this is an installed capacity cost. Natural gas and wind have much higher capacity factors than solar, meaning that on the basis of energy production per kilowatt of installed capacity, wind and gas can produce more energy.

Estimated Installed Cost of Renewable Energy over Time ($/kW)



Source: Energy Information Administration, *Annual Energy Outlook 2022*.

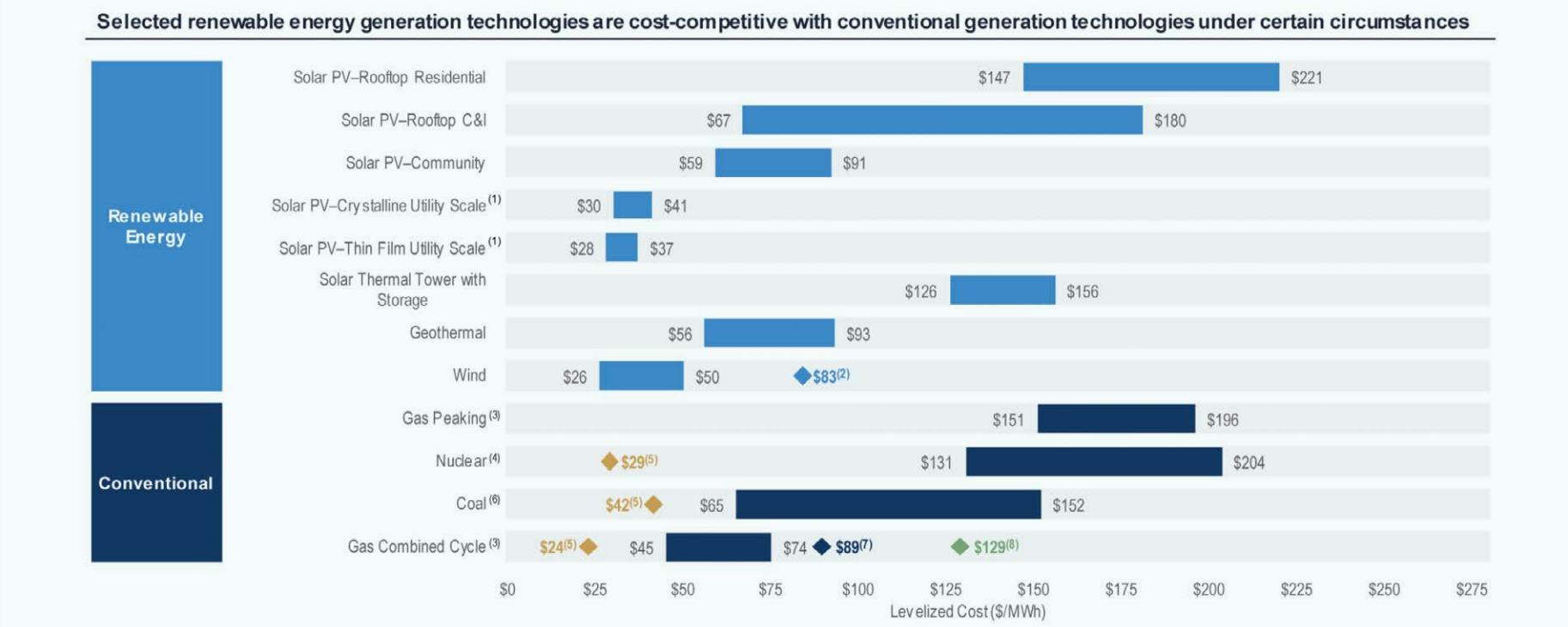
Levelized Cost of Energy

The levelized cost of energy (LCOE) is a measure of the net present value of the cost of electricity over the lifetime of a generation asset. It can be used to compare different generation or contracting options. The measure includes the original development and construction costs, rebates, grants, tax incentives, maintenance, operations, fuel, and demolition/salvage costs.

The figure shows projected LCOE costs in 2021 for the major power generation technologies. This provides a relative indication of the life-cycle cost from these sources. As indicated, wind LCOE is below $50/MWh and solar below $41/MWh, and both are below the range for life-cycle costs of almost all new conventional generation. Renewables are also in line with the marginal cost of generation from nuclear, coal, and gas combined cycle (shown as gold diamonds), assuming fully depreciated units. Solar is a bit higher priced than wind, but its generation will be through the peak of the business day when electric prices are usually at their highest in most markets. Wind is more sporadic but tends to be higher at night and in the winter when electric market prices are lower.

The bottom line is that new renewable generation is less expensive than new conventional sources, which gives an idea of where real estate firms can expect prices to be for PPAs and VPPAs, depending on region.

Levelized Cost of Energy by Technology



Source: Lazard, https://www.lazard.com/perspective/levelized-cost-of-energy-levelized-cost-of-storage-and-levelized-cost-of-hydrogen/.

REC Strategies

As discussed at the beginning of this guide, ownership and retirement of RECs is the basis for taking credit for renewable energy in reporting and public statements on greenhouse gases. A key benefit for a company in entering into a contract directly with a named renewable energy generator is the transparency of the contract: the real estate firm can point to a specific generation asset as its clean energy supply. However, a company does not necessarily have to retain and retire the REC generated by the generator it contracts with to still receive the benefit.

REC pricing does vary across the country because of factors discussed earlier. One can sell the project-specific REC received through a PPA or VPPA and purchase in its place a less-expensive national certified REC. Such a transaction, sometimes referred to as "REC arbitrage," could be done to make the economics of the PPA more attractive, to offset settlement costs, or to generate a return initially or during the term of the agreement.

Consider the REC purchase strategy when making comparisons between renewable generators in different regions that may have significantly different REC prices.

Consumption Data and Utility Invoices

The energy consumption total organizations need to supply, or offset, is important to calculate for all contracts. For PPAs, renewable asset-backed retail contracts, and utility tariff programs, this calculation means collecting and reviewing the portfolio's utility invoices. This information is critical as it explains how much annual energy consumption an organization needs to procure, as well as the peak demand or load on each account.

Utility invoices can be complicated. Consider using energy consultants to help navigate through the organization's utility invoices. Their expertise can help identify opportunities for renewables in both regulated utilities and competitive markets.

Depending on the type of contract selected for procuring renewable energy, the renewable energy contract may replace some line items on a utility bill. Broadly, several categories of service costs are covered in a utility bill:

- **Generation:** The cost of the produced energy.
- **Distribution:** Pays for the local wires and transformers used to deliver electricity.
- **Transmission:** Covers the cost of the high-voltage grid that transmits power from large generating stations to the local distribution grid.
- **Ancillary services:** A common name for a group of services required for grid reliability that includes items like generation reserves, voltage support, frequency support, and the administrative cost of grid operation.
- **Taxes and societal benefit charges:** Covers the utility rebate/incentive programs for demand-side management energy efficiency improvements and other programs.

In regulated, vertically integrated markets, one company provides all these services together so these charges are combined and consolidated; customers may not see line items with these names on the utility bill. In deregulated states, these charges are generally disaggregated. In those areas, the local utility is responsible for only the distribution charges and usually collection of taxes and societal benefit charges. An energy supplier is responsible for collecting the rest through generation supply competitive markets and the grid tariffs for transmission and ancillaries but may bundle them together into one contract price.

In deregulated areas, a PPA, as a physical supply agreement, would cover the energy portion of the generation costs, but there will still be transmission, ancillary services, and (in some regions) generation capacity or resource adequacy costs that will be billed by the grid operator. With a renewable-backed retail contract, the retail supplier would package all of these costs into one contract along with the renewable energy supply.

Typically, the only way to avoid the utility-billed charges like distribution and societal benefit charges, sometimes called "non-bypassables," is for the property to generate electricity on site. Even then, an organization may have to pay in the form of standby charges.

The largest line items on electric supply invoices are energy consumption charges and demand charges. The total and relative size of each depends on utility tariffs and state laws. To compare costs between different off-site renewables options and the current situation, buyers need to be careful to take into account which charges can be replaced with the new renewable energy contract and which ones will remain.

If the property is in a deregulated market, the owner should gather existing energy supply contracts. It is critical to know when the current supply contract ends, because some of the solutions may not be implementable until then or else may face early contract termination penalties. For instance, a PPA is a supply contract, so a new PPA could not be started until the current contract expires.

Set the Plan in Motion

To better navigate the procurement process, it is important to diligently plan internally and lean on external consultation as appropriate. The company needs to strategize for several aspects, including vendor solicitation and volume size, among other considerations a well-thought-out team can help manage.

Assemble the Project Team

The purchase of renewable energy is a team effort. Assemble a diversified team that can provide valuable feedback on the different parts of the procurement process. Internally identify the necessary authority, skills, and experience to execute the project. Key participants in the process and their roles include the following and may vary based on portfolio- versus project-level procurements:

- **Project or sustainability manager:** The leader of the renewable energy efforts internally. The owner and driver within the organization tasked with leading the evaluation, execution, change management, and reporting regarding clean energy and often ESG in general. The main coordinator and communicator for the renewable energy purchasing effort.
- **Executive sponsor:** A high-ranking executive who acts as the internal champion for renewable energy (or ESG in general). This role provides not only executive oversight within the organization but also the political cover and clout to help achieve the goals. This may or may not be a formalized position but should be a person of influence who is supportive of the initiatives.
- **Property manager:** At the property level, communicates with tenants and coordinates operations on the ground. For property-level off-site renewables contracts, the property manager may be the main liaison with the supplier.
- **Asset manager:** Manages the budget at the property level. This role is critical for approval of the contract and budgeting for off-site renewables procurements.
- **Procurement:** Companies may require participation by a centralized procurement function, which typically brings a standardized approach to buying. However, energy contracts, and PPAs even more so, are very specialized contracts to which standardized terms and conditions often do not apply. The terms could hinder getting a contract executed or obtaining the best terms. Using a specialized energy procurement adviser can augment internal staff and provide the necessary expertise.
- **Inside counsel:** General contract review and monitoring adherence to corporate contracting guidelines.
- **Outside counsel:** Renewable energy procurements, particularly PPAs, are complex, sophisticated legal instruments requiring legal expertise not generally present within a real estate business. Many large firms, and even some smaller firms and sole practitioners could be used who have specific experience and expertise in these contracts. The terms and regulation in this area are specialized and obscure. Counterparties will have these specific legal experts and the organization's firm should as well.
- **Facilities and engineering:** Experts in equipment, buildings, and energy use will be needed, particularly for on-site renewables projects.

- **Accounting:** PPAs and VPPAs may need specific accounting treatment. Accounting needs to be brought into the group early to inform them of the plans, especially when off-site renewables costs might be spread across multiple properties. They may need to consult with the company's auditors to ensure compliance.
- **Tax:** Review the tax implications of the agreements.
- **Internal and external auditors:** Review the transaction for proper accounting and tax treatment.
- **Finance:** Advise on the availability of capital, the use and sources for borrowing, and the consequences of different credit collateral vehicles.
- **Tenants:** Many tenants have their own ESG goals. Involve them in the process, if possible. The collaboration can be beneficial.

Using a fully in-house team may be the best route to take for large organizations that plan to make many transactions and can afford the cost of hiring, paying, and retaining professionals with these specific skills. However, it may be prohibitive for smaller firms to handle the entire deal in house. If an organization does not have the roles and expertise required in house, it may consider bringing in outside expertise to support the team.

Outside experts can bring instant knowledge, relationships, and experience to the table to augment internal capabilities. The savings and efficiency can be well worth it. Outside advisers or partners to engage could include the following:

- Energy consultants;
- Renewable-energy brokers;
- Renewable engineering company;
- A renewable project developer;
- Traditional energy broker;
- Environmental specialist lawyers; and
- Local utility company (in some markets).

Once organizations have identified the key contributors to the process for the project team, the project manager should consider the goals, biases, and motivations of each. Are they aligned with the ESG and renewable energy goals? If not, take the time to understand the positions and strategize on how to realign or influence them.

Further, make sure to understand the decision-making and approval process within the organization. Set or confirm expectations early. Lay the groundwork so that when it is time for a decision, the organization's decision makers are primed with the facts and data each needs to quickly provide necessary approvals.

People already in the organization are likely have some expertise in energy in the property staff, engineering, or accounting areas. Make sure it is understood how energy is currently procured and engage these staff members early in the decision-making process for renewable energy.

Leverage the Procurement Process

Companies may have set guidelines for major procurement processes that can be leveraged. Here are some examples of potential ways to proceed for off-site renewables procurement:

- **Single source:** This approach means negotiating directly with one vendor exclusively. The downside of this noncompetitive approach is that real estate owners risk paying a higher price or not working with the best in the business. A single source also may not have access to the best projects in the area.
- **Informal bidding process:** This method may entail talking to several potential providers informally and taking offers from each. Without the rigors of a formal process, it may be harder to make apples-to-apples comparisons between competing bids.
- **Formal competitive bidding process:** This approach typically entails creating a formal RFP specifying exactly what the suppliers are expected to bid on.
- **Reverse auctions:** Online reverse auctions for renewable energy are a way for energy sellers to compete for a buyer's business in an optimized and fast manner. Reverse auctions are when the vendors bid down the price to sell a product or service to the buyer. Using reverse auctions for sourcing energy in competitive retail markets has been a strategy for large buyers for close to 20 years. Now, some firms are using this technology to procure renewable energy of all contract types. While similar to a paper-based RFP process, an online reverse auction adds efficiency and transparency to the pricing process and can speed decision-making and action.
- **Aggregation:** Like many products, economies of scale can gain the buyer a better price and terms. In recent years, PPA deals have been done with utility-scale wind and solar projects that involve several companies joining together to make one aggregated purchase to gain the needed economies of scale.

Identify Potential Vendors to Solicit

It helps to know who to reach out to when starting the off-site renewable process. This section explores the brokers, suppliers, and developers that represent each option for renewables.

- **PPAs and VPPAs:** These are typically offered by developers of utility-scale projects.
  - Affiliates of large utilities: These entities are typically well funded but may be rigid and difficult to negotiate with. One recent trend is for utilities to divest themselves of generating assets and their project development arms, leaving the resulting affiliates to offer renewable energy products.
  - Independent project developers and owners: Some are small companies and may have yet to complete a project. Others are larger operations that may develop, own, and operate dozens of large projects.
    - The smallest developers may only create a project and take it through an early stage or to pre-construction before selling it to another developer with better resources to complete the project.
    - Some independent developers have financial backing from equity investors that pay for the early-stage development and potentially become the sponsor equity for developed projects.
    - Careful due diligence needs to go into selection of a partner. Cover execution and nondelivery risk by requiring liquidated damages for late project completion.
- **Renewable-asset backed retail contracts:** Several retail suppliers working in competitive markets can offer contracts with renewable energy supply from specified generation projects.
- **Renewable energy credits:** RECs can be procured from several REC brokers, specialty commodity brokers, utilities, or retail energy suppliers in competitive markets.
- **Carbon offsets:** Specialized brokers trade in carbon offsets. Other sources are the creators of the offsets, who could be large manufacturers, oil refiners, timber companies, large agriculture companies, or even other commercial or government property owners. Some utilities and gas suppliers are also offering carbon offsets packaged with the gas supply.
- **Community solar:** These are specialized developers. The states or utilities that offer these programs often have lists of developers registered to build projects in their program and may also have lists of projects completed or under development with capacity available.
- **Utility green tariffs:** This is contracted directly with the utility provider and its renewable energy programs.

Determine Volumes to Procure

Determining the volume of off-site renewables to procure depends on the portfolio's total energy consumption (kWh) and peak energy demand (kW); energy supply contracts are sized in both energy (how much is used in a period of time) and capacity (peak rate of use instantaneously or averaged over an hour). Renewable energy generation is sized based on the system's maximum output, which is a capacity value. The buyer is most likely trying to supply or cover the annual consumption of the portfolio or property with renewable energy and must understand the supply volumes and capacity of the supply contract to make sure goals are met.

The volume calculated for the portfolio is likely not static. If the property is still undergoing energy efficiency improvements, or if on-site power generation may be installed in the future, or if the portfolio has upcoming acquisitions or dispositions, be sure to work with the stakeholders who are leading the changes. They should be able to provide future estimates of the energy volume requirements.

If procuring carbon offsets, the units are in carbon emissions, typically metric tons of carbon dioxide. A property's emissions data may be available from a utility, state, U.S. Environmental Protection Agency, U.S. Department of Energy, or utility regulatory authority, or the organization's energy supplier. The more specific an organization can make the data source, the more accurate an organization's emissions calculation will be. If an organization has a contract with an energy supplier, use the supplier's emissions reporting. Consult the guidelines of the ESG compliance or reporting regime the company is using, if applicable.

In many jurisdictions, the state or other governing authority has mandated that utilities and other load-serving entities (i.e., utilities and competitive retail energy suppliers) purchase a minimum amount of energy from renewable generation. These are commonly known as renewable portfolio standard programs. Properties in these markets are therefore already supplied by a certain amount of renewable energy and, in some sustainability reporting, buildings can take credit for these purchases. These are often called "compliance" programs, and the utilities and load-serving entities are purchasing "compliance" RECs to meet the requirements of the renewable portfolio standard program.

If a supplier is already providing part of the supply through renewable energy, the property may be able to take credit for this renewable energy supply toward the organization's ESG goals, thus reducing its voluntary purchases of renewable energy.

For example, the state of Illinois requires that in-state energy supply include 19 percent renewable energy. A state agency purchases those RECs for compliance, and those costs are included on the distribution utility invoice. Therefore, a property in Illinois can take credit for the purchase of those RECs. If a property in Illinois wants to claim 100 percent renewable energy supply, it only needs to voluntarily procure RECs to cover 81 percent of its consumption.

Set Timelines

Develop a timeline with all of the stages of the procurement process. Contract negotiations can take a long time. Also include the time for a renewable energy developer to build a new project (see figure). Depending on the starting point and the off-site renewables solution(s) selected, this could be a process that takes several years before the benefits can be received. Make sure this timeline lines up with corporate goals or commitments and executive or investor expectations. Some of these products, like RECs, offsets, or utility tariffs, can be used in the short term to meet corporate sustainability goals while waiting for a longer strategy like a PPA to be implemented when an off-site renewable generation project has been constructed.

Timing to Procure Off-Site Renewable Energy Options

Source: Transparent Energy.

Evaluate and Decide

Implement the procurement process and invite targeted suppliers to bid/provide offers that meet requested requirements. Use appropriate decision factors and evaluation criteria to assess which off-site renewable options could be best for the organization.

Evaluation Criteria

There are many criteria to consider when evaluating bids from different off-site renewables suppliers. Upon review, compare the term lengths for each contract. Following this, specify the delivery point in an RFP and closely read the risks of any deviations in responses. For example, what were the range of basis price spreads historically between the delivery point and a meter, and how could it potentially change in the future? This is an area where an outside expert could aid in analysis of historic and future market prices as well as potential shifts in congestion costs or basis spreads.

Pricing is an important factor in bid evaluation. A lower price may look competitive at first, but be sure to understand what adjustments to the price are allowed, in case retail energy prices in the future are cheaper than the contract's price. Some PPAs include an annual price escalation clause. Make sure to note the escalation in any comparisons between offers. Consider, how does the escalation affect the economics and the effective price of power over the term of the agreement? Then, evaluate the pricing related to past energy prices in the area as well as forward market price estimates.

Taking a step back to assess the renewable energy developer or project owner and facility itself is of equal importance. Does the entity that made the bid have strong credit and extensive experience? If this is a new construction project, what is the developer's background in new development? If entering a PPA with an existing facility, perform thorough due diligence on the project and its operating history. It is recommended that organizations use an expert third-party adviser for this analysis.

Consider the availability of the generator. An availability clause requires the seller to maintain the generation project so that it is available to produce power a very high percentage of the time. Compare the availability clauses offered by different developers. The higher the availability percentage, the better the contract is for the buyer.

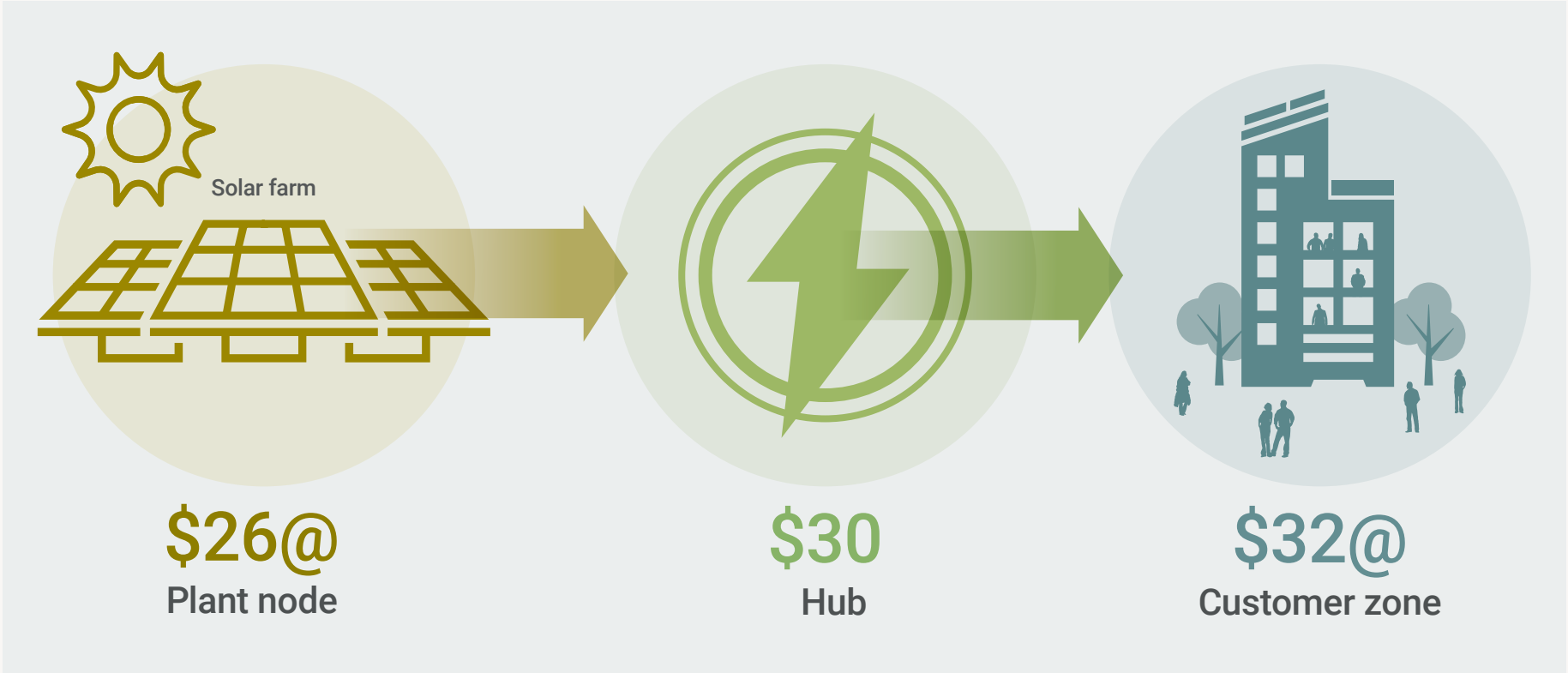
Last, are there any societal benefits mentioned in the bid?

Assessment of Basis Risk

The delivery point of the electricity is a comparison between projects and a negotiation point for the contract and needs to be specified. The delivery point is typically a specific point on the electric grid and is usually designated as a specific node or hub, which are designated trading and delivery points. Price differences between two nodes or node-to-hub are known as basis, or sometimes referred to as “congestion” (see figure).

In the case of an off-site PPA or VPPA, there will be a price difference between the point at which the generator delivers its power to the grid and where the customer takes its power from the grid. Basis creates cost risk because the wholesale market-based prices between those points change at different rates. Each side will want the point of contract delivery to be close to its own point of interconnection to the grid to reduce its price risk.

Basis Example in Electricity Delivery Contract



Source: Transparent Energy.

Execute the Deal

When executing the deal, buyers of off-site renewable energy need to be aware of the various considerations that may arise in the contract. Contracting with an attorney is recommended for the more complex off-site renewables options like PPAs, as is becoming familiar with the nuances that could arise in negotiations.

PPA Contracting Considerations

Organizations need an expert contract attorney to aid in drafting and negotiating any PPA, whether physical or virtual. Corporate counsel may need to be supplemented with outside counsel that have expertise in negotiating PPAs, and such expertise is available at many national and even some local law firms. This section is not being provided as legal advice, but rather to identify issues to be considered in negotiation.

- **Commercial term sheets:** These are used in the utility industry to define the specifics of the transaction in industry terms. Term sheets are often used at the start of a negotiation to reach agreement on the business terms.
- **Development milestones:** If the PPA is being supplied by a proposed new facility that is not yet constructed, establish specific milestone dates in the contract that can trigger either a termination for breach or a penalty on the developer. The most important date will be the Commercial Operation Date (COD), which is the official start of energy delivery under the contract. Delays may cost the buyer money and delay receiving the benefits of the renewable generation; the ideal contract would make the developer cover any losses.
- **Price floor:** Spot power prices can and do drop below zero. For a buyer, a negative price means it is getting paid to use electricity. When selling electricity, a price below zero effectively means that the seller is paying for its electrons to be taken away. Wind farms that are receiving a production tax credit (PTC) will continue to operate when spot prices drop as far as the negative value of the PTC, which can be as high as $25/MWh. In a VPPA, a spot price below the contract fixed price is a settlement cost to the buyer. To limit VPPA settlement cost risk, consider setting a floor at $0/MWh or higher. The seller may require a higher fixed price to compensate it for this risk, but the floor may be worth it to protect the budget.
- **Term length:** Typical PPA contract terms are 10 to 20 years to match financing terms and equipment life.
- **Termination clauses:** This authorizes the party to terminate the contract under certain circumstances without breaching contract.
- **Credit:** Because of the length of these contracts, renewable developers and their financiers want to see that the offtaker is strong financially, so will require investment-grade credit for the buyer. Alternatively, credit support can be provided in the form of parent guarantees or letters of credit. As the buyer, if leveraging parent guarantees or letters of credit, be sure to include the costs of these instruments in the project economics. Require that the renewable energy developer, including any subsequent owner of the renewable energy plant, also post credit. Include language for both buyer and seller to be able to request financials and provisions for actions, including potential termination, in the event of a credit downgrade, insolvency, or bankruptcy.

- **Breach of contract:** In addition to breach caused by credit or financial defaults, a failure to maintain the equipment or adhere to other contract requirements may constitute a breach. In addition, failure to deliver a minimum amount of energy should trigger a breach, which could, if left uncured, result in liquidated damages and termination.
- **Liquidated damages:** Specific liquidated damages in the event of project delay, breach, default, or other failures should be defined. The best approach is to reference market prices from objective third-party sources at the time of default. Also consider requiring the seller to provide makeup RECs in the event of project delivery delays. Common requirements are for the seller to provide national Green-e RECs in an amount of the expected average daily energy delivery for the PPA for every day of project delay.
- **Force majeure:** A list of events excusing performance that are outside the parties' control should be agreed on.
- **Regulatory change:** PPAs customarily have provisions for termination without penalty in the event that regulatory change or change in law makes the contract illegal or imposes extraordinary costs on either party.
- **Insurance:** Insurance clauses should specifically list the minimum amount of coverage for both liability/casualty and property.
- **Other seller requirements:**
  - Maintain equipment in compliance with manufacturer warranties.
  - Use industry best practices for operations and maintenance.
  - Obtain and maintain all necessary permits and licenses.
  - Maintain and abide by all land leases.
- **Right to inspect:** Include the right to inspect the site and equipment as well as books and records.
- **Monitoring and reporting:** Define in the contract what reporting the organization may want to see and when.
- **Performance guaranty and availability clauses:** Availability is effectively the plant's up time. It is a measurement of the percentage of time that the plant is available to operate. Usually, the calculation methodology is clearly defined in the contract. Carefully review what exclusions are allowed from the denominator of the equation.
- **Assignment clause:** If the real estate asset(s) using this energy could be sold during the term of the agreement, make sure the contract can be assigned to a new owner. If the PPA is for a portfolio, assignment could allow for the replacement of one property for another property or properties with similar energy consumption and location.

Coordinating Renewable PPA Power Supply with Existing Energy Contracts

In deregulated electricity markets, most customers are on fixed-price contracts for the supply of their entire load for set term lengths. In regulated markets, the utility tariffs are generally fixed prices that can be changed only through regulatory approval processes. When entering into a PPA, organizations need to take care to coordinate the capacity being contracted on the PPA or VPPA with the load of the property and the retail supply contracts.

- **Physical PPA:** A physical PPA is typically designed to supply the entire load of a property. However, organizations will need to procure the remainder of the energy when enough electricity is not being generated by the asset supplying the PPA. This is sometimes referred to as "firming" the supply.

The most straightforward answer is to take the hourly spot market price, however, that introduces substantial pricing risk (an extreme example is from February 2021 in Texas when that market price shot to $9,000/MWh, or $9/kWh, for several days). One potential answer is to work with a retail energy supplier that will manage that risk for an organization through various structures that could include fixed prices, caps, or collars.

- **Virtual PPA:** With a virtual PPA, a concern is double-hedging the load, which introduces unintended budget risk. A VPPA is a fixed-for-floating swap. With the virtual PPA, the buyer still has to separately procure a contract for the physical supply to the property. If that is also a fixed price, the property is effectively double-hedged. If the spot price of power falls, the buyer will owe a cash payment to the VPPA seller, and thus the budget is at risk. On the other hand, if the property contracts for a floating retail price at the same index as the VPPA settlement (if possible), the property's budget may actually be perfectly hedged. Careful attention must be paid to the entire contract situation.

Nuanced Considerations for the Real Estate Sector

The real estate industry is presented with particular off-site renewable energy deal challenges regarding nuances such as taxes, term lengths, and acquisitions/dispositions. Due diligence on how an asset may be affected by these areas will help streamline the process of off-site renewables.

Tax challenges specific to real estate. Real estate investment trusts (REITs) in particular have limited eligibility for government tax incentives. Engage expert accountants to verify any tax issues for particular legal structures. For example, REITs are not eligible for the U.S. federal investment tax credit (ITC), a tax credit that can be claimed on federal corporate income taxes for 26 percent of the cost of a solar PV system that is placed in service during the tax year. While this hinders the financials for some renewable energy options, it does not ruin the business case for all renewable energy options.

Risks with term lengths and disposition/acquisition of assets. Frequent acquisitions and dispositions of properties can make long-term contract commitments difficult. If organizations are executing a PPA for a single property, it is likely that the PPA will need to be assignable to a new owner if the building is sold. Negotiate for an ability to assign agreements to successor building owners and for replacement of like buildings or loads in the agreement.

However, it is more likely that an organization is considering a PPA at a portfolio level with the volume sized to cover a number of properties. Contracting considerations differ for physical versus virtual PPAs.

With a portfolio approach to a physical PPA, an organization may be able to negotiate a clause allowing for the replacement of a property that is being sold with another one acquired or added in its place. In that case, ideally, the annual energy consumption of the added property will be similar to that of the dropping property and in the same geography or utility territory. "Natural" portfolios or funds of properties—ones that organizations view as always staying together as a group because of location or capital structure, for instance—work well for grouping on a physical PPA or VPPA.

Ultimately, excess energy or RECs from a PPA/VPPA that cannot be used can be sold into the market at spot prices, which introduces price and budget risk. However, if the production gets significantly higher than the properties can use, organizations could encounter accounting treatment issues as a result of the oversupply. Future adjustments to purchase volumes may need to be negotiated at that time with the supplier.

A better option for real estate portfolios to consider is contracting using VPPAs at the portfolio or corporate level to alleviate some of the unique issues for commercial real estate. By its nature, a VPPA, being "virtual," is not tied to supply energy directly to properties. It can be sized below the expected usage amount for the portfolio with separate REC purchases making up any additional requirements. Buying and selling of individual properties is immaterial to the contract. If enough buildings are sold that the contract is sized too high, excess RECs can be sold into the REC market.

Opportunities with Tenants

Building owners or managers may include interested tenants in renewable energy purchasing. Procurement of off-site renewable energy could also provide an opportunity for a high-quality property to differentiate itself, gaining either higher occupancy or higher rents.

Many corporate tenants themselves have established ESG and/or renewable energy goals. If the tenant has its own electric utility account, it can consider renewable energy purchasing on its own for its use. If the tenant does not, or the base building provides a portion of the energy consumption (like HVAC), the tenant may prefer the property procure renewable energy on its behalf.

A tenant purchasing renewable energy on its own could face commercial limitations with the renewable energy products discussed in this article. For instance, typical commercial leases are not 10 to 20 years, so PPAs may be out of the question. One option is to negotiate transferability of the renewables contract to a new location if the tenant moves at the end of the lease, or transfer to a successor tenant. Another solution is to select products like REC purchases or renewable-backed retail contracts that can be contracted for terms matching or less than the lease term.

Consider the following example of a tenant engaging its landlord on renewable energy purchasing: An anchor tenant in a downtown, multitenant office building has a goal to purchase 100 percent renewable energy and is purchasing RECs to cover 100 percent of the usage on its utility accounts. However, the tenant's sustainability managers noted that the building handles the purchasing of energy for the HVAC system and common areas. By reaching out to building management, the tenant found that the building was not supplied by renewable energy. Building management is now working with the tenant on a plan to purchase renewable energy in the future, and the two stakeholders may aggregate their purchasing.

Risks and Mitigations with New Renewable Development

It is important to keep in mind in the due diligence process the risks that arise with off-site renewables, both technological and developmental, as well as the mitigants if these issues arise.

Technology risks. Organizations need to ask questions and do homework to ensure that the equipment the developer is installing will be reliable and durable for the term of the contract. Wind and solar equipment have a design life of at least 20 years, but as existing installed equipment is getting to that age, the industry is finding that maintenance costs and failure rates vary significantly across different manufacturers and equipment designs. Following are some questions to ask:

- What make and model of critical equipment is the developer planning to use on the project?
- What is the durability record of that equipment?
- How strong is the warranty?

Consider hiring an independent engineering firm with renewable energy experience to evaluate the design and equipment selection for the project.

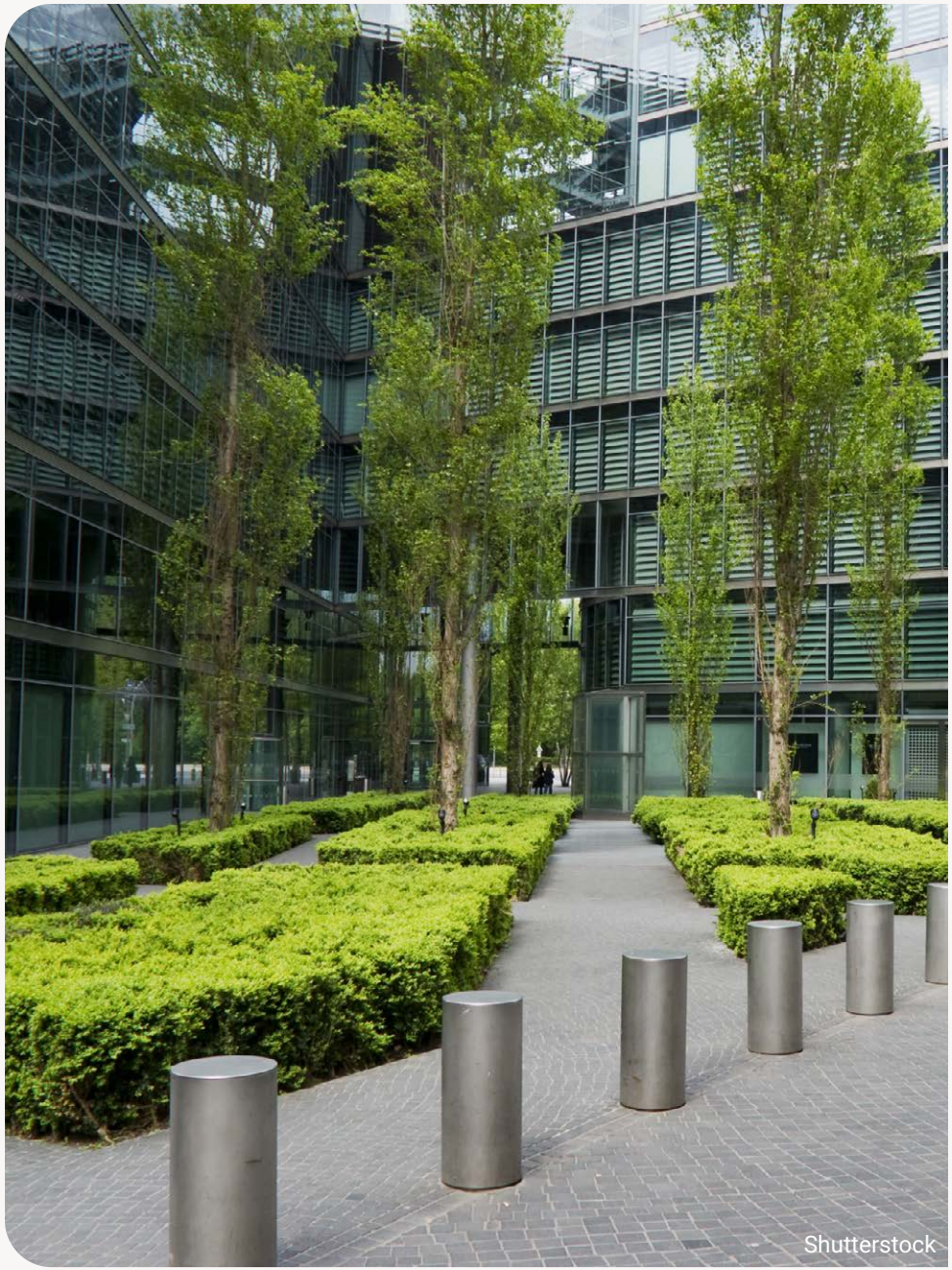
Development risks. Development of a new utility-scale renewable project is typically a multiyear project with many potential roadblocks throughout the process that can be fatal to the project's completion. Performing this due diligence requires expertise in the field, so it is another good area for hiring a consultant.

Reporting from the Renewable Energy Seller

The off-site renewables contract should specify certain reporting on the part of the seller. Such reporting will provide the buyer with transparency into the contract details and performance. Be sure also to specify any report elements required for the buyer's ESG or financial reporting.

Construction progress reports must at least include major milestones. Operating reports from the supplier are critically important to monitor performance of the asset as well as contract compliance. Monthly or at least quarterly, the supplier should be required to provide actual results compared to expected results for at least these metrics:

- Energy produced;
- Warranty claims;
- Natural resource availability;
- Lost time accidents;
- Availability;
- Complaints or litigation;
- Efficiency measures;
- EPA violations;
- Major equipment failures and failure rates; and
- Other regulatory actions.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Conclusion

The commercial real estate industry is seeking solutions to decarbonize portfolios for the betterment of the climate, to address demands from key stakeholders, and to garner the financial advantages. On-site renewable options may not be viable for every asset owner, and the market has produced many off-site renewables opportunities to fill the gap.

Off-site renewables are a meaningful tool on the path to reaching climate goals and are moving the industry toward a greener future. It is crucial to perform due diligence and effectively evaluate off-site renewable energy options with a diversified team before making a selection. Real estate firms must understand high-level local regulations and policies, as well as the local context of an asset to determine viability, return on investment, and ultimately the best options available for off-site renewable solutions.

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