

The Role of RECs and Additionality

IN GREEN POWER MARKETS

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- » **Commercial purchasing of renewable energy is at an all-time high.** Buyers are motivated by a variety of goals including economics, environmental commitments, and financial additionality.
- » Green power environmental and marketing claims have an articulation, but they are not the same, and the same products cannot necessarily be used to accomplish both.
- » Buyers who want to make environmental claims and use green power to meet emission reduction goals must rely on energy attribute certificates, such as renewable energy credits (RECs).
- » In the U.S., buyers who want to make claims that their green power purchase was additive—whether or not it helped them meet their environmental goals—must look to PPAs, distributed generation, or other products outside of nationally-sourced RECs.



Renewable electricity acquisition has been on the rise worldwide due to environmental and economic factors. Many C&I buyers are interested in the “additionality” of their purchase—whether their action caused more renewable energy to be added to the grid. This paper examines the intersection of energy attribute certificates (EACs) such as RECs and additionality, and will seek to clarify their relation in the modern energy landscape.

The recent uptick in corporate renewable energy purchasing has made a big splash in the news and the green power industry. In 2015, a full 52% of the new wind power in the U.S. was the result of corporate clean power purchases in the ICT, manufacturing, healthcare, and retail sectors.

Why all the Buzz?

Commercial, industrial, and institutional (C&I) buyers are pursuing large-scale renewable energy for a number of powerful reasons. These include attractive economics, commitments to carbon neutrality, and financial additionality. For many buyers, green power purchasing is the fastest way to achieve these simultaneous goals.

What is less commonly understood is that the breadth of the green power market is concurrently—and rapidly—expanding. More than ever before, corporate buyers have a choice about how they acquire clean energy and how they promote their purchase to their stakeholders. However, not all green power products are the same, and not all purchases confer the same financial and reputational benefits.

In this paper, we'll take a look at the spectrum of green power options and specifically discuss how buyers can realize the benefits of clean power purchasing—and how not all products or claims are created equal.

An Overview of Green Power Products

Renewable energy purchasing by C&I buyers has been on a steady upward trajectory for the past decade as interest in, and consumer pressure for, more responsible business has grown.

The initial tool for C&I green power purchasing was the renewable energy certificate (REC). To date, billions of kilowatt-hours (kWh) of green power, worldwide, have been generated, traced, and certified through the trading of RECs. RECs are still a core component of thousands of organizations' energy portfolios, including NGOs and utilities.

RECs were introduced in 1999 as a means of creating an “electricity label” for renewable energy generation, with the original intent of traceability in environmental and emissions claims. Due to the inability to verify clean energy sold into the spot market, stakeholders in California proposed that the environmental attributes of that energy be separated from the electrons themselves, making it easier to track and trade. The process effectively created two entirely separate commodity markets: wholesale electricity and RECs. Today, there are a variety of EACs similar to RECs in the international marketplace: Guarantees of Origin (GOs), Tradeable Instruments for Global Renewables (TIGRs), Goldpower®, and I-RECs among them. We will focus on RECs in this paper.

EXISTING GREEN POWER PRODUCT OPTIONS

 Competitive power procurement

 Onsite (distributed) generation

 Virtual net metering

 Direct power purchase agreements

- New development
- Existing projects

 Global energy attribute certificates (such as RECs)

 Financial (or virtual) power purchase agreements

 Utility green tariff

 Investments

- Tax equity
- Sponsor equity

When electricity is generated from a renewable source, EACs—such as RECs—are also produced in a one-to-one ratio as the proof of that clean generation. The wholesale electricity is sold into the grid, while RECs are sold into the environmental commodities market. However, it is the RECs that represent the environmental attributes of the electricity generation. As a result, in order for energy—even energy from wind and solar—to make the claim that it is clean generation, that electricity has to be bundled with RECs. When the electricity and RECs are separated and sold as discrete commodities, the energy buyer can no longer make “green” claims. Instead, the owner of the retailed RECs—who has purchased them either bundled with power or on a completely separate market—has a custodial right to these claims.

RECs are the means by which all buyers in North America and much of the world—including organizations, utilities, and homeowners—take possession of the environmental attributes of clean electricity generation. Green power purchasers wishing to make sustainability or carbon reduction claims must be the owner of the RECs associated with that generation or purchase RECs on the open market that correspond to their electricity usage.

In the U.S., bundled RECs have been essential to the growth of both the compliance (utility) and voluntary (non-utility) green power markets. Utilities use green power RECs to meet their state-mandated renewable portfolio standards (RPS), particularly in states where clean power generation is constrained by geography, regulation, or other factors. In voluntary markets, consumers ranging from multinational corporations to individual homeowners have paired RECs with their grid-purchased or onsite-generated electricity in order to make green power claims.

For C&I buyers, the ability to claim the environmental attributes associated with the RECs they purchase has become a fundamental strategy in addressing the emissions generated from grid-sourced electricity. Without investing in distributed generation, it has historically been difficult or impossible for organizations to directly source clean energy from a renewable generator. Instead, buyers have purchased electricity from their utility while simultaneously purchasing RECs for ownership rights to the environmental claims.

RECs remain the only way that a North American buyer—including a utility—can claim and prove that it is using green power. Nonetheless, market progression has opened up a new and wide array of green power options and contracting structures that provide C&I buyers with the means to choose green power benefits beyond those conveyed by a REC. Chief among these options is the utility-scale power purchase agreement, or PPA. Traditionally used by banks and utilities as a form of financial hedge, PPAs have come to the fore over the past several years as a tool for C&I clean power buying. An increasing number of non-utility buyers—primarily high tech and manufacturing companies including Facebook, Microsoft, Corning, Dow, Philips, and Amazon—have used PPAs as a mechanism to lock-in lower priced, reliable wind and solar power.

Using RECs to Make Green Claims

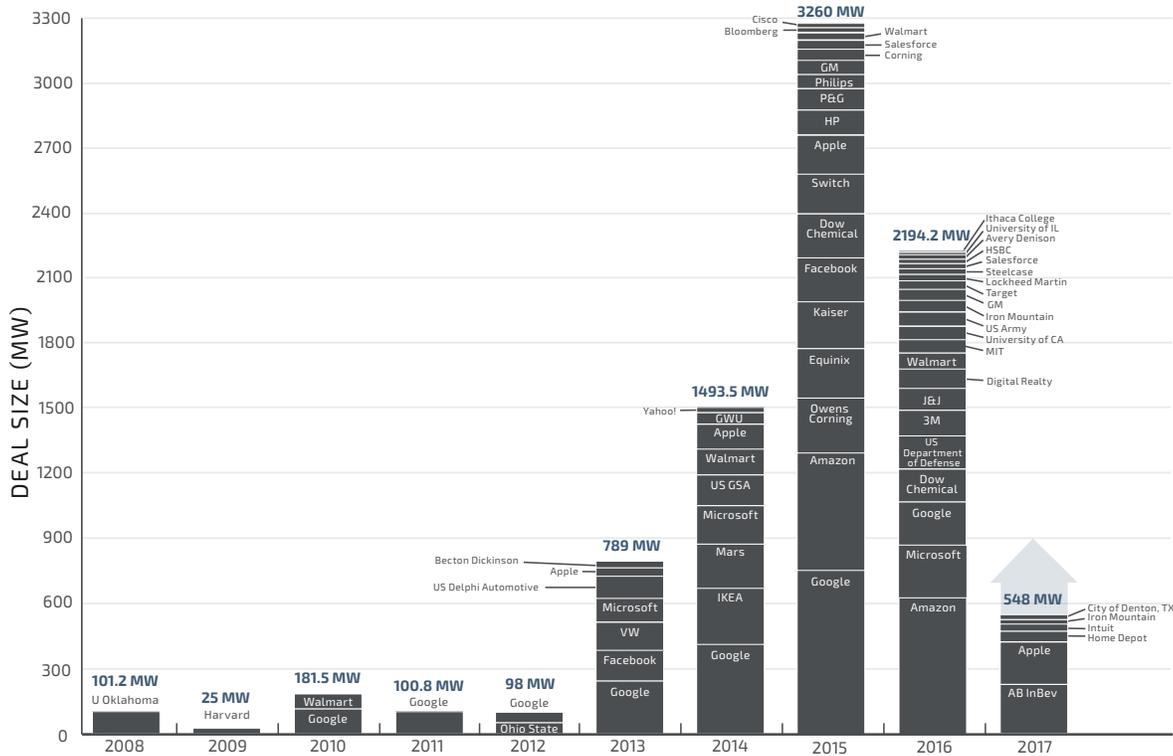
Regardless of its source, nearly all U.S. energy generation joins the national grid. When consumers draw electricity from the grid, they receive the grid mix of their particular utility, which includes both conventional fossil fuel and renewable generation.

However, if buyers purchase RECs equivalent to their use of grid-sourced electricity, they also own the environmental attributes of those clean, carbon-free RECs. This allows the buyer to effectively neutralize the emissions impact of their electricity consumption. By purchasing RECs equivalent to the amount of power they are drawing from the grid, buyers ensure that an equal volume of power has been added to the grid by renewable energy sources and that this energy has been earmarked for their ownership.

In this case, RECs act as a ‘proof of purchase’ for clean energy generation, allowing buyers to make claims to their purchase, such as “we are reducing our environmental impact by choosing green power.”



AGGREGATE OFFSITE RENEWABLE DEALS IN THE C&I SECTOR*



PPA market growth is accelerating rapidly, with experts projecting another strong year in 2017.

*Based on publicly announced C&I PPAs (direct, synthetic, green tariff, and tax equity) in the U.S. and Mexico. Excludes onsite PPAs. Last updated 03.30.17.

A variety of technologies in a rapidly falling price environment are also making distributed generation more accessible for commercial buyers. Tools ranging from solar to fuel cells and emerging contracting structures like virtual net metering, community solar, and tax equity investing are expanding the options available to companies who want a clean solution. Not to be left behind, utilities are beginning to deploy green tariffs to support their corporate buyers, driven largely by the demand of leaders such as Google and Apple.

What is crucial to understand about each of these emerging products is that they all still rely on RECs to convey their environmental attributes. Even in a large-scale PPA, electricity must be bundled with RECs in order to be considered clean generation. RECs remain the only mechanism in North America, and much of the world, that allows buyers to make green power claims.

Understanding Additionality

Ownership of environmental attributes and their associated claims is not the only motivation for C&I buyers, although this is a significant objective for many. For others, favorable economics or financial additionality are imperative considerations.

Additionality means that, "but for my action, a specific outcome would not have occurred." In the context of green power generation, additionality indicates that without a green power purchase or investment, new renewable energy would not have been financed, developed, and added to the national grid. Additional green power is renewable energy that wouldn't have happened otherwise.

Making a purchase with a claim to additionality interests many C&I buyers who are looking to use their renewable energy or carbon reduction commitments to differentiate themselves from their competitors. But additionality is a nuanced principle to understand. While the concept may be theoretically clear, it has created confusion and disagreement, with even industry experts struggling to fully comprehend it.

Part of what complicates additionality in green power generation is that there is no clear and universally applicable definition of what makes an action additional, nor any accepted way to track it (unlike RECs, whose chain of custody is monitored and verified by programs such as the Center for Resource Solutions' Green-e® Energy). The concept and claim of additionality can be applied to a range of factors that influence project development, including:

- **Displacement:** The project was responsible for actually displacing fossil fuel-generated electricity from the grid and replacing it with a clean source of generation like wind or solar.
- **Traceability:** The clean energy can be traced from the point of generation to the point of consumption.
- **Financing:** The clean energy project could, theoretically, not have been built without an additional source of revenue or credit.
- **Price point:** The higher the price of an environmental commodity, the more likely a claim of additionality.
- **Tax incentives:** The project was able to be built thanks to financial relief provided by the Production Tax Credit (PTC) or Investment Tax Credit (ITC).
- **Emissions avoidance:** The project resulted in actual, demonstrable avoidance of emissions.
- **Timing:** A project that theoretically would have found a buyer someday is accelerated via the support of a buyer today.

The consequence of the variety of additionality definitions and applications is that multiple parties can make legitimate additionality claims against a project: the developer, the PPA off-taker, the land owner, the financier or investor, the technology manufacturer, and even the REC purchaser, in some markets. Each of these stakeholders can potentially claim that without their contribution, the project would not otherwise have been built—and all of them are right.

Unlike RECs, additionality is not an objective commodity; there can be multiple "owners." There is not a single additionality claim per project like there are single environmental attribute claims (RECs) per megawatt-hour (MWh). It can be difficult to pinpoint exactly which additional actions led to the success of any single project, making it appropriate for all owners to lay claim to additionality. It is, in effect, a marketing, or reputational, claim.

The Articulation of Green Power Products and Additionality

The application of an additionality test becomes nuanced when it is administered to actual green power products. For example, historically, some buyers have sought to make financial additionality claims tied to the voluntary purchase of RECs. To do this, one would need to demonstrate that RECs provided financial support to renewable energy projects and that those projects would not have been viable without this added revenue.

Are there additional RECs?

One reason that some entities may question the value of RECs is that there exists a mismatch in supply and demand in some markets. Too little demand for national RECs means that prices tend to be lower, whereas higher demand for specific RECs (based on technology type, location, or other factors) drives prices up.

The REC market is highly fluid. While there are regions in the U.S. grid where there is a surplus of low-cost RECs, there are also regions where RECs can make a credible claim to at least a portion of a project's additionality. This is typically in competitive regions where state RPS requirements place a demand on available RECs, which drives up prices. While price itself is not a guarantee of additionality, it is an indicator of supplementary capital for project development.

There are also examples of a REC purchase being essential to the development of a new wind farm. Durable consumer goods manufacturer Steelcase was one of the first voluntary buyers to secure a long-term strip of RECs and back it with corporate credit, allowing the REC stream to be added to the financing stack of a new wind project.





The rationale behind these additionality claims was that, so long as fossil fuels were cheaper than renewables, the need to purchase both wholesale electricity and RECs to make green power claims resulted in more money being spent on clean energy generation. Traditionally, the added cost of RECs was viewed as an industry subsidy. Proponents of REC additionality pointed to the subsidy as financial support that helped to build more clean energy projects.

However, as the green power market has expanded and abundant supply of RECs has outpaced demand in some regions, the additionality claim of RECs has been challenged. The assertion is that a national REC market that is oversupplied with low-cost RECs creates no discernible subsidy, and, therefore, has a negligible financial impact on the facilities they come from. Hence, these RECs make no real difference to the growth of a green grid. This has led some C&I buyers to discount the value of RECs as a green power purchase.

PPAs, on the other hand, have a much stronger claim to additionality because of their size and scope. It can be readily argued that the credit backing of a large multinational corporation can make all the difference for a new project that is looking for financing, particularly when the C&I off-take of these projects can range from 25 – 100% of the actual power generation.

But here, additionality does not allow the buyer to fully achieve all of its goals. While the PPA may have meant the difference to a project, allowing the C&I buyer to make a claim of financial additionality, additionality

itself carries no claim to the environmental benefit of a project. Additionality has the power to expand the market, but it is only RECs that contain green power's environmental attributes.

The Value of Both RECs and Additionality to The Green Power Market

Although fundamentally different—and mostly unrelated—both RECs and additionality confer important renewable energy claims that are extremely valuable to the development of clean power generation. Until a 100% renewable grid is achieved, a means to track and trade green power, and stakeholders to help new projects get built, will be necessary.

By providing products that have either environmental claims or additionality claims—or both—the market becomes driven by consumer choice. This market recognizes both the value for voluntary green power purchases, regardless of their claims to additionality, and the value of additionality claims, regardless of their association with environmental attributes. This is effectively the market that exists today. This market allows C&I buyers to choose RECs, additionality, or both to meet their goals.

Here's a summation of the valuable role that both RECs and additionality play:

RECs

RECS are the “proof of purchase” of carbon neutral energy generation. The primary role of RECs is to prove and validate carbon neutral energy generation. No matter how new or efficient a renewable energy facility is, every MWh of clean electricity that it generates, while bundled with RECs, produces negligible carbon. All RECs contain this property of essentially carbon-free electricity. The inherent value in RECs is the fact that the energy they represent was produced with zero, or near zero, emissions instead of extracting and burning fossil fuels.

This value is the same whether the RECs are produced from a small onsite solar system or from a utility-scale wind farm, from an existing project or a new one: any financial additionality of those RECs is irrelevant to their inherent value. For C&I buyers who have made public commitments to renewable energy generation or carbon reductions, RECs are, in many cases, the only means for these buyers to achieve their goals.

RECs are an indicator of market demand. The buying and selling of RECs establishes an essential market indicator critical for clean energy development and investment. As each market becomes more mature and renewable energy becomes more desirable, RECs tend to increase in value, rather than decline. This can be seen in the growth of EAC markets worldwide and the increasing demand for similar international commodities such as Goldpower, I-RECs, TIGRs, and Guarantees of Origin.

RECs are a free market instrument. RECs were a key mechanism to providing consumers with choice about their electricity consumption at a time when choices were few, and continue to be the appropriate green power option for thousands of buyers for whom a long-

term PPA or onsite installation remains inviable. Since RECs are separate from the wholesale electricity they are generated from, they are not tied to a specific grid region, giving RECs great flexibility in their purchase and application. Plus, not all RECs are created equal. Free market RECs can be sourced from a variety of technologies, and from a number of deregulated energy markets, which creates variability in both the type and price of RECs available.

RECs convey the environmental attributes of green power. RECs encompass the environmental benefit of producing electricity from clean, renewable energy, and exist to track and trade this benefit. This benefit exists whether or not the cost of the REC enabled the project it was sourced from to get built. The environmental value is not any less for the extremely efficient wind farm that would have gotten built anyway than it is for the inefficient wind farm that needs the REC value to get financed.

RECs are flexible and highly customizable. As a global, free market, tradeable commodity that conveys title to renewables generated on the grid, RECs give C&I buyers a choice over which types of clean technologies they purchase. C&I buyers have a wide range of commodities to choose from, differing in price, presumed additionality, technology type, and geographic location among others. C&I buyers can exercise discretion in choosing the cheapest RECs available—which still represent carbon free energy generation—or by choosing a local, technology-specific, or highly expensive, arguably additional REC, which is the brilliance of RECs as a tradable commodity. Over time, it is this consumer choice that drives both the development and value of renewables.



RECs support emerging green power markets. In nascent markets with no active or credible ability to track and trade ownership of renewable claims—such as those in developing countries—RECs provide an enormous value. In these environments, despite consumer demand to pay a premium for renewable products, there are few or no voluntary commitments being made. Only once a trustworthy REC market has been established and buyers can be assured that their commitments will return unique claims (which will not be made by other organizations—whether commercial or governmental), does one begin to see the emergence of robust voluntary participants.

RECs—or their equivalent—are still the only way that green power is tracked & traded, worldwide.

Additionality

- **Additionality drives market development.** Additionality drives off-takers to make financial investment in new renewables through PPAs or other contracting mechanisms, which gets new projects on the grid. It also leads to innovation in project off-take agreements, product development, and emerging markets. Ultimately, these investments and innovations lead to reduced emissions from fossil fuel generation.
- **Additionality gets projects built.** Most renewable energy projects cannot be financed and built without a secured, creditworthy off-taker like a utility or corporation. There are far more viable projects in the market than there are PPA off-takers, which makes the role of additionality very straightforward: without that long-term commitment, the project wouldn't get built.
- **Additionality is competitive.** For the C&I buyer considering a PPA or equity investment, the claim that "our action got a wind farm built" may be one of the primary drivers of corporate interest in renewable energy. Additionality claims help C&I buyers draw public attention to the growth of renewable generation and their role in that generation, specifically. Take Google, for example, who has repeatedly, publicly commented on the importance of additionality in their project selection process. Green claims are attractive to consumers, who are often willing to pay more for goods and services produced by responsible companies, and green actions can help reduce social pressure from the public and NGOs.

The Take-Away for C&I Buyers

It is vitally important for C&I buyers to understand that their involvement in the voluntary green power market—whether buying inexpensive national RECs or a long-term PPA—is critical to the continued development and expansion of renewable energy. Which products buyers select, and how they interface with the market, will depend on their budget, their tolerance for risk, and their emission reduction and public relations goals.

Bottom line, C&I buyers that want to use renewables to meet their goals around reducing emissions from purchased electricity must rely on RECs. Buyers who want to be able to make the claim that their purchase got a new project built—whether or not it helped them meet their environmental goals—should look to PPAs, onsite purchases, or equity investments to achieve additionality.

A claim to additionality does not necessarily also guarantee a claim to carbon-free energy; only RECs can provide that.

The distinction between RECs and additionality is critical here. Buyers can choose environmental attributes (RECs), additionality, or both. For example, when contracting for a PPA, the buyer has a number of choices available to them about the treatment of the RECs associated with the electricity the project will produce. They can choose to keep, sell, or exchange those RECs, depending on their goals. If the buyer chooses not to keep the RECs, then it loses the ability to make claims about the environmental attributes associated with that electricity. They can, nevertheless, still claim the additionality of the project.

The historic correlation of RECs with additionality becomes even more confusing when considering onsite sources of generation, such as rooftop solar. In many markets, the financial viability of onsite projects hinges on utility incentives that are typically offered in order for utilities to get enough solar built to meet mandated RPS goals. Generally, in exchange for the incentive, the utility, rather than the buyer, gets to keep the RECs that the system produces.

For instance, if a New Jersey buyer with a rooftop system wants to claim they are using green power, but has surrendered the rights to their system's RECs to the utility—who is looking to meet the PJM grid region's aggressive RPS goals—they must buy unbundled RECs to back-fill. Without RECs bundled with the installation, the

power is technically not green. While some C&I buyers understand this distinction and do back-fill rooftop systems with RECs, many have not and are likely making environmental claims that would run afoul of the Federal Trade Commission's Green Guides.

The decision about which type(s) of green power products to pursue ultimately depends upon what a C&I buyer wants and the story they wish to tell. If the most important thing is access to carbon-free electricity, then a PPA inclusive of RECs or a low price, national REC is the appropriate choice. If buyers want a high value, high additionality product that also allows them to claim carbon neutrality for purchased electricity, then a higher

priced REC in a competitive RPS region or a PPA where the RECs are retained by the buyer, is attractive. If additionality is the most important claim, then buyers should support a new project in the form of a PPA (with or without RECs) or via an equity investment.

Regardless of which mechanism they use, C&I buyers can be assured that their choice to participate in the voluntary green power market has a significant impact in the overall shift in the grid away from the dirty, volatile fossil fuel generation of the past, in favor of the reliable, carbon-free grid of the future.



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