WHITE PAPER

An Edison Energy® Insight

Renewable Energy, Additionality, and Impact:

AN FAQ ON THE U.S. VOLUNTARY RENEWABLE ENERGY MARKETS

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Introduction

The voluntary market for clean energy is exploding. According to the Power Forward 3.0 report, 48 percent of the Fortune 500 and 63 percent of the Fortune 100 have set greenhouse gas (GHG) and/or renewable energy targets, and hundreds of universities, municipalities, and smaller companies have similar goals. Meanwhile, at least 118 companies have committed to use 100 percent renewable electricity through the RE100 campaign. According to the Business Renewables Center at the Rocky Mountain Institute, over the last five years, corporations have contracted for almost 9,000 megawatts (MW) of renewable energy. Edison Energy has helped companies, cities and universities identify, analyze and execute more than 2,000 MW of that total via new long-term wind and solar power purchase agreements (PPAs).

Organizations continue to pursue renewable energy PPAs for both risk management and financial value, since these instruments can reduce exposure to energy price volatility. But renewables purchases are also often driven by sustainability goals, such as greenhouse gas (GHG) reduction targets, and buyers increasingly want to know their purchase will have the direct effect of increasing renewable energy generation and lowering carbon emissions. This desired effect is commonly referred to as "additionality," a term borrowed from the carbon offsets market, where it describes projects that result in real and verifiable emissions reduction or avoidance.

Organizations continue to pursue renewable energy PPAs for both risk management and financial value.

While this term is increasingly used in the renewables market, it is important that buyers understand the difference between the markets for renewables and carbon so their related—yet distinct—tradeable attributes (RECs and offsets) are not conflated.

This document provides guidance to organizations navigating the sustainability aspects of renewables transactions. Through a series of questions and answers, it explores how buyers can describe their impact and leadership in bringing new renewables online and transforming the grid, and share the most credible and transparent stories about their purchases with stakeholders.

What is "additionality" and is "impact" a more appropriate metric for the renewables market?

Additionality is the concept that an environmental good (e.g. a greenhouse gas reduction project) can be determined to have occurred because of a specific action, and that the good is "in addition to" a baseline scenario that would have happened anyway.

The concept of additionality originated in the carbon offsets markets. A GHG or "carbon" offset is a unit of carbon dioxide-equivalent (CO_2e) that is reduced, avoided, or sequestered to compensate for emissions occurring elsewhere. Buyers can use offset credits, measured in tons, to reduce their GHG inventory as an alternative to making their own direct reductions. For an offset project to be deemed "additional," it must meet several stringent tests. For instance, it cannot be common practice or required by regulation, its emissions reduction/avoidance/sequestration must be "in addition to" a business-as-usual scenario, and the financial incentive from the offset market must be reasonably found to have enabled the project. Thus, additionality is not only the determination that an activity will have positive benefits relative to a baseline scenario, but it also requires causation—that the proposed activity happens because of a certain policy intervention or action.[1] This determination is made by an accredited verifier through a detailed, project-level validation process, based on published methodologies.

> The term "impact" provides a more appropriate and inclusive way to describe how organizations are affecting the market with their purchases.

While additionality has these very specific requirements for carbon offsets, the term is often used in the renewable energy market as well, but without a similar set of tests. In the voluntary renewables market, additionality is generally used to describe when an organization's purchase (e.g., an agreement to offtake power via a PPA) causes the construction of new clean energy facilities. Buyers often like to claim that this incremental generation is "additional."

The United States Environmental Protection Agency's (U.S. EPA) Green Power Partnership (GPP) describes it in this way:

*Some organizations … desire to claim that their green power purchase has had a direct **impact** on the deployment of a new renewable energy project. This claim requires that a buyer engages with a project prior to its construction and ensures that the buyer's type of engagement **substantively contributes** to the project's financeability.*[2] *[emphasis added]*

Even though additionality has become a ubiquitous term in the renewables market, its use can cause confusion as organizations struggle with the complexity of carbon accounting and the differentiation of offsets and renewable energy certificates (RECs). The is a significant risk of conflating "carbon additionality" (which helps to ensure that carbon has been reduced or avoided in the atmosphere) and "renewables additionality" (which has no similar carbon reduction claim), though they each have different meanings.

U.S. EPA's use of the term "impact" provides a more appropriate and inclusive way to describe how organizations are affecting the market with their purchases. Whereas carbon additionality is a binary state—a project is either additional or not—there are many ways organizations can have impact and show leadership in the renewables market. Demonstrating leadership by describing these impacts accurately and credibly should be the goal of all market participants.

Credibility and transparency are key when making claims about renewable power use, whether from onsite generation, PPAs, or unbundled RECs. This will be discussed further below, but buyers can consult resources such as RE100's "Making Credible Renewable Electricity Usage Claims" from CDP and The Climate Group, Section 260.15 of the Federal Trade Commission's Green Guides, U.S. EPA Green Power Partnership's Making Environmental Claims for further information.

What is a REC?

A Renewable Energy Certificate or Credit ("REC") is a tradeable instrument that conveys ownership of the claim that one megawatt-hour (MWh) of renewable energy was generated and delivered either to an end user or onto the grid. Leading renewable energy programs such as the Green-e Energy Renewable Energy Standard and the U.S. EPA Green Power Partnership define "new" RECs as those generated from projects up to 15 years old on a rolling basis.

RECs were created in the late 1990s to track states' Renewable Portfolio Standards (RPS), and they are currently used both in voluntary and compliance markets. A REC conveys the environmental attributes of the renewable energy (the "renewableness"), and they can be sold either together ("bundled") with the underlying electricity, or stripped and marketed separately ("unbundled"). Only REC owners can claim they are using zero-carbon electricity, and if applicable, use them to reduce their Scope 2 (indirect) emissions from purchased electricity.[3] To learn more about RECs, see the EPA's Green Power Partnership website.

Do RECs impact the building of new renewable generation?

RECs continue to be an important instrument in both the voluntary and compliance (state RPS) renewable energy markets in the United States. However, short-term REC procurements are generally not viewed as effective drivers of incremental renewable generation. Long-term REC procurements may, in some situations, have an impact on the building of new projects if they provide enough of a financial driver.

Unbundled RECs have been an important tool for organizations wanting to participate in the voluntary renewables market, from small businesses and residential customers to some of the largest corporate purchasers (see the GPP's Top 100 list). But short-term REC procurements—generally sourced in one- to three-year "strips"—are not a clear driver for building incremental renewable generation. RECs typically have a very low monetary value (currently less than $0.50/MWh in the voluntary market), and thus are generally not a factor in the new project financing. For example, a three-year REC purchase from a creditworthy counterparty will generally not provide enough revenue certainty to secure construction financing for even a small renewable generation asset. Rather, it is a buyer's long-term commitment to purchase a project's future

> The renewables market is dynamic, innovative and evolving. New product structures and solutions may emerge and be worth consideration on a case-by-case basis.

power generation that provides the guaranteed revenue necessary to move the project forward.

Some long-term REC procurements may have a more distinct impact on a project's construction if the PPA alone does not provide enough revenue to secure project financing or the meet the project's internal hurdle rate. In this case, a long-term REC agreement (e.g., 10 years), which would generally be priced higher than short-term REC prices, could be the determining factor for the project to move forward.

These instances are atypical, but are a useful reminder that the renewables market is dynamic, innovative and evolving. New product structures and solutions may emerge and be worth consideration on a case-by-case basis.

What is a carbon offset?

A GHG or "carbon" offset represents one ton of carbon dioxide-equivalent (CO_2e) that is reduced, avoided, or sequestered to compensate for emissions occurring elsewhere.[4] Offset credits must be independently verified and registered, and once retired can be used to reduce any part of an organization's emissions inventory in lieu of making the reduction itself.

Because an organization can use offset credits to reduce its Scope 1 (direct) emissions as though it had made the reduction itself, very strict tests for additionality must be applied to determine if CO_2e has been reduced, avoided or sequestered by the project that generates the credits. These tests work to ensure that the offset project would not have taken place in a business-as-usual scenario (the project is not common practice and is not required under regulation), and the financial incentive from the offset market could be reasonably determined to have caused the project to occur. A project developer must follow an accepted methodology or protocol from a recognized authority such as the Climate Action Reserve, American Carbon Registry, the Verified Carbon Standard or the UN Clean Development Mechanism, and undergo an initial assessment and a final review by an accredited third party to verify the project's offset claims.

Are RECs and carbon offsets used for different purposes in carbon accounting?

Yes. While RECs can only be used to reduce an organization's Scope 2 (indirect) emissions from purchased electricity, carbon offsets can be applied to any part of an organization's overall GHG emissions footprint.

The GHG Protocol, developed by the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), is the standard for most of the world's GHG accounting. In setting an organization's operational boundary, the Protocol divides emissions into three distinct categories, or scopes:

> Scope 1: Direct emissions from sources that are owned or controlled by the organization, including on-site fossil fuel combustion and vehicle fleet fuel consumption.

> Scope 2: Indirect emissions that result from the purchased electricity, heat, steam or cooling from a utility or other provider.

> Scope 3: Other indirect emissions from sources not owned or controlled by the organization, but that are part of the organization's value chain, such as: employee travel and commuting, capital goods, upstream and downstream transportation and distribution, suppliers' direct emissions and purchased energy, and product use.

Under the Protocol, carbon offsets can be used to reduce an organization's footprint in any scope, while RECs may only be used against the purchased electricity portion of Scope 2 and Scope 3 emissions.[5] As these emissions are indirect (not from the organization itself), additionality is not required from an accounting perspective.[6]

While renewable energy projects have been used to generate offset credits in developing countries through the United Nations Clean Development Mechanism (CDM), with rare exception this has not been in the case in the United States due to existing and expected carbon regulation on the utility sector. (In Europe, renewable energy would not qualify as the utility sector is covered by the European Union Emission Trading System.)

Another challenge to offset verification of renewable projects is the potential for double counting of avoided emissions. Offset credits represent a property right for a GHG reduction/avoidance/sequestration that is unambiguously owned, and if a renewable project reduces the output of a fossil-fired power plant, the fossil plant owner would be expected to claim the resulting emissions reductions.

In theory, a U.S. renewable energy project could go through the lengthy and expensive process of offset verification,[7] though if the project were found to have carbon additionality, the resulting offset credits would be more expensive than the RECs the project would normally generate (both due to transaction costs and the fact that offsets generally command a higher market price because of their greater fungibility). Given that strict carbon additionality is not required to reduce indirect Scope 2 emissions in the GHG Protocol, most organizations would not choose to pay considerably more to use offset credits generated by a U.S. renewables project to reduce this part of their inventory.

What is a PPA?

A renewable energy power purchase agreement (PPA) is a bilateral contract between a renewable energy generator (e.g. wind farm, solar plant) and an energy user (e.g. company, university, city) in which the buyer agrees to offtake power from the generation facility generally for a specified period (generally 10–20 years).

PPAs can be structured in different ways to meet buyers' specific criteria:

> In a "direct" or "physical" PPA, the renewable generation and end user are in the same regional grid and the user takes "physical delivery" and no longer purchases electricity from its utility. (Note that unless the generator and user are directly connected, it is impossible to trace electrons once they enter the grid.)

> Alternatively, in a "virtual" or "financial" PPA structure, the generation asset may be in a different grid from the buyer. The buyer and developer still execute a long-term contract, but, rather than take physical delivery of the power, the agreement is settled financially. This means that the buyer agrees to buy the project power for a pre-determined price over the length of the contract. As that power is generated, it is sold on behalf of the PPA buyer into the local grid's wholesale power market at spot prices. If the fixed contract price is above the spot market price, the buyer pays the developer the difference. If the contract price is below spot market pricing, the buyer receives the difference. This is known as a "Contract for Differences (CfD)." Meanwhile, the buyer continues to purchase commodity electricity from a traditional source, a utility or competitive supplier.

Regardless of whether the contract is "physical" or "virtual," the renewable asset generates a REC for each MWh of electricity produced. The contract determines whether the RECs are retained by the developer, transferred to the buyer, or retained by the buyer and replaced by non-project RECs, a process known as REC arbitrage (described on page 9).

Do PPAs impact the building of new renewables generation?

Yes: When it is an integral component of ensuring that a new renewable energy facility is constructed, a PPA allows an organization to claim leadership and impact by causing an incremental amount of renewable energy to be generated and delivered to the grid.

When a PPA is signed for a new generation facility, it enables the construction that is incremental to the renewable energy that already exists. Since the project did not exist previously, there is no doubt that it is increasing the amount of renewable energy that is available for consumption.

A long-term offtake contract provides the revenue certainty that allows a project developer to secure project construction financing: Not only is the project newly constructed, but it would not have been built without the offtake agreement. While the project will generate both electricity and RECs, it is typically the financial value of the long-term power offtake that allows the project to secure

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construction financing and proceed. The financial value of the future REC stream is almost always significantly lower and will not by itself attract the capital markets' participation. The buyer's impact thus comes from the act of enabling the construction of the facility itself through the PPA and not the discreet value of the associated RECs. (As noted above, there are cases when a long-term REC strip may have an impact on construction if the expected revenue stream from the PPA alone would not be enough to initiate construction.)

If the buyer in a PPA decides not to retain the RECs from the project, it must be careful and transparent in how it describe the transaction and ongoing environmental claims. This is described further in the "REC arbitrage" and "claims" sections below.

Are RECs from a PPA different from unbundled RECs for GHG claims?

RECs generated by the project in a PPA provide the identical claims to unbundled RECs, and neither provides a claim of net carbon reductions in the atmosphere like a carbon offset.

While the buyer in a PPA can claim it has had an impact on driving incremental renewable generation, the RECs it receives from the PPA are no different than any other REC on the market. The impact story comes from the PPA itself, not the associated RECs.

Does REC arbitrage affect the impact of a PPA?

REC arbitrage does not alter the fact that it is the long-term PPA itself, not the RECs, which allows the project to be financed and built.

REC arbitrage occurs when the renewable energy PPA offtaker chooses to sell the RECs from the project and buy replacement RECs from another, generally less expensive, source. This might occur in a state with a Renewable Portfolio Standard, where in-state project or solar RECs may command a premium price.

> As with all renewables claims, it is critical that the offtaker be credible and transparent when engaging in REC arbitrage.

REC arbitrage does not alter the fact that it is the long-term PPA itself, not the RECs, which allows the project to be financed and built. Thus, neither the project RECs nor the replacement RECs have the impact of adding incremental renewables to the grid; they equally represent the claim that one MWh of renewable energy was generated.

As with all renewables claims, it is critical that the offtaker be credible and transparent when engaging in REC arbitrage. While the offtaker retains the right to claim leadership and impact since the PPA is what allowed the project to be built, by engaging in REC arbitrage, the buyer can no longer claim that their renewable energy came from that facility. However, the replacement RECs, if retained and retired by the buyer, can be used to reduce their Scope 2 emissions of purchased electricity. Before making claims, buyers should refer to their renewables

advisor, and resources such as RE100's "Making Credible Renewable Electricity Usage Claims" from CDP and The Climate Group, and section 260.15 of the Federal Trade Commission's Green Guides.

Some organizations have distinct preferences for securing the RECs specific to their PPA projects. Other organizations have not had a preference for project RECs v. arbitraged RECs. The voluntary market has been able to accommodate both models. This underscores the importance of organizations sharing their renewables stories clearly and transparently.

Does a PPA's structure—physical v. financial ("virtual")—change its impact?

Both physically-settled PPAs (in which the underlying electrons are contractually "delivered" to the offtaker) and financially-settled PPAs (in which the power is sold into the wholesale market on behalf of the offtaker) can have equal impact on the grid, since they both result in incremental renewable generation.

End users typically buy electricity through a contract with an electric service provider (e.g., a utility). Under a renewable energy PPA, a company signs a long-term contract with a renewable energy project developer to offtake the power from a generation facility.

This is generally done in one of two ways. The first is a physical PPA in which the generator delivers the power generated by the project to the offtaker. A physical PPA is most often executed between a project and an offtaker located in the same regional grid. Physical PPAs can be executed across grids, but the added cost and complexity is unlikely to be compelling.

In a financial PPA—sometimes called a "virtual" or "synthetic" PPA—the buyer and developer still execute a long-term contract, but the new renewable power is sold on behalf of the offtaker into the project's local wholesale power market at spot prices. Financial PPAs are typically set up as contracts for differences (CfDs). In this construct, if the PPA contract price is above the spot market price at which the power is sold, the offtaker pays the project developer the difference. If the PPA price is below the spot market price, the offtaker receives the difference. Meanwhile, the buyer continues to purchase electricity from its traditional supplier, utility, competitive supplier, etc.

It is worth noting that once electricity is delivered to the grid, it is impossible to track individual electrons from a specific project to a specific customer, thus even "physical" PPAs are ultimately financial instruments.

Regardless of which structure a buyer chooses, if the PPA itself is enabling the new renewable project to move forward, the transaction has the impact of facilitating incremental renewable generation.

Does the project location of a PPA matter?

If a PPA contributes to the construction of a new renewable facility, the buyer's impact in causing the project to move forward is the same regardless of project location. However, location may matter for other reasons, such as for those organizations that want to impact their local grid, or for those that wish to estimate where a renewable project would have the largest potential impact to displace fossil fuel use or reduce GHG emissions.

While a PPA for a new-build project in any locale causes incremental renewable generation, buyers may prefer to contract with a project in their regional grid or home state. Some buyers weight proximity in their project selection criteria so that they can point to local economic development or environmental benefits, or so that they can more easily take stakeholders—staff, customers, students—to visit the project.

Because regional grids have varying carbon intensities due to their generation mixes, similarly sized projects in different regional grids may have different carbon impacts. For example, a 100 MW wind project in New England (which has very little coal-fired power and a high percentage of natural gas and nuclear) will potentially displace less carbon than a new 100 MW wind project built in certain regions of the Midwest (which has a much higher percentage of coal in its mix).

The carbon intensity of the power the project may avoid on the grid can differ due to many factors such as the time of generation and grid congestion. In the extreme, a renewable project in a grid with 100 percent fossil fuel generation would have the most impact, while a project on a 100 percent renewable grid would have a very minute, marginal GHG impact.

While it is possible to estimate avoided carbon from a new renewable facility, there has been no consensus on the methodology to do so, given the complexity of power generation and flows at any given point in time.

To determine where a new renewable project might have the most impact, most offtakers derive general estimates using EPA's Emissions and Generation Resource Integrated Database (eGrid) factors for the project's location to determine the potential amount of carbon displacement. Other tools include EPA's Avoided Emissions and Generation Tool (AVERT), and methodologies being developed by WattTime, a non-profit subsidiary of the Rocky Mountain Institute.

While the decision to contract with a renewable project in a certain region due to the potential to displace emissions could be part of the buyer's impact story to stakeholders, this impact is not the same as a carbon offset. Unless the project goes through project-based accounting and is validated and verified using an accepted offset methodology, true carbon additionality cannot be assured, and buyers should not claim they are "offsetting" emissions.

Finally, the issue of project location is somewhat controversial in the carbon world, and some groups have criticized carbon offsets because they take place at a location other than at the facility claiming the reduction. Many environmental groups such as the Environmental Defense Fund, National Resources Defense Council, World Resources Institute, and the Center for Climate and Energy Solutions have endorsed offsets in part because the atmosphere does not care from where a carbon reduction comes. For addressing climate change, total CO_2 equivalent in the atmosphere is the only important metric.

Does the price of a PPA matter?

If a PPA is integral to the construction of a new renewable energy facility, the price is generally irrelevant to the impact the buyer has on the renewables market.

A long-term PPA—which allows for the financing and construction of new renewable generation facility that would not have been built otherwise—drives the impact story the buyer can tell. In this context, the PPA's cost per MWh of electricity—and whether that cost is above or below fossil energy prices—is not relevant.

If a company secures a new-build wind PPA at a discount to the current energy market, that project could still be said to have impacted the renewables market if it is the PPA that enables the project to be constructed and begin operating.

There are many factors that contribute to PPA pricing, including natural gas prices, location (the wind blows more consistently in Texas than Massachusetts, for example, and the sun shines more in Arizona than Vermont), the relative difficulty of building wind or solar in certain markets relative to others, contract negotiations, and many other factors.

Increasingly, new renewables projects can compete economically with existing grid energy. If a company secures a new-build wind PPA at a discount to the current energy market, that project could still be said to have impacted the renewables market if it is the PPA that enables the project to be constructed and begin operating.

Does PPA term length matter?

Renewable energy PPAs are generally 10–20 years in length, with some shorter terms now available in the market. If the contract is long enough for the developer to secure financing and move forward with construction that it would not have been able to do otherwise, then the PPA has the impact of providing incremental renewables on the grid.

How do aggregation or buyers consortium models affect PPA impact?

Impact considerations are generally similar in a consortium or anchor/satellite buyers model. The fundamental question is whether the project—or subsequent phase of a project—would have proceeded without the participation of the buyer(s). Buyers participating in innovative procurement models may wish to make extra efforts to share their story and describe its innovative elements with stakeholders.

The renewables market continues to innovate new procurement structures to allow broader and more efficient participation by energy users. Edison Energy's PowerBloks™ PPA is one example: Under PowerBloks, a project's output is divided up in to smaller, shorter off-take tranches, expanding the universe of eligible buyers. We expect the market will continue to introduce new structures: Buyers will want to consider the specific impact elements of these structures as they emerge.

The market is already familiar with the buyers consortium model—in which multiple buyers align to go to the market together—and the anchor/satellite model—in which a larger buyer (the "anchor") will execute a PPA for a large slice of a to-be-built project, allowing other buyers to follow with the own PPAs for the remaining project capacity.

Consider a 100 MW project: In a consortium model, two buyers might execute coordinated 50 MW PPAs with the project. In an anchor/satellite model, one buyer might execute a 70 MW PPA, allowing the project to secure financing and begin construction. A subsequent second buyer could execute a 30 MW project, causing the ultimate full build-out of the project as planned.

The two different buyers in each example are having a credible impact in creating new renewable capacity on the grid. All the buyers in these examples can share a credible impact story with their stakeholders.

Can a PPA with a repowered renewable energy facility have a positive impact?

PPAs involving repowered facilities may have an impact, but the narrative is more complicated.

The renewable energy market in the United States has matured to the degree that some of the oldest facilities have much less efficient wind turbines or solar panels than are available today. Such facilities may be able to improve their productivity and economic performance if they replace their generation assets in a process called "repowering."

The U.S. EPA GPP and the Green-e Renewable Energy Standard both consider a renewable energy facility to be "new" if it began commercial operation within the last 15 years (on a rolling basis). A repowered facility will be considered "new" if the facility has been repowered "such that 80 percent of the fair market value of the project stems from new generation equipment installed as part of the re-powering."[8] This determines only that the facility is qualified to generate GPP- or Green-e-eligible RECs, not whether it has added incremental generation on the grid. Whether a PPA signed with such a repowered facility increases the amount of renewable generation is more complicated than with a new-build project.

If the facility were going to be decommissioned unless it was repowered, and the project's financing depended on

the PPA, the buyer could claim to have made an impact in maintaining renewable generation on the grid. If the repowering were to increase generation capacity, and if the PPA were required to advance construction, the buyer would have driven the increased capacity. As with all claims, it is incumbent on the buyer to tell a transparent and credible narrative.

Does the WRI/WBCSD Scope 2 Guidance, CDP scoring methodology, or the Science Based Targets Initiative provide "extra credit" for driving incremental renewable generation through a renewable energy PPA rather than buying unbundled RECS?

At this time, none of the organizations above provide any specific recognition for PPAs above and beyond the RECs generated by the underlying project. It is up to the renewables buyer to communicate the impact of its purchase.

Section 11.3 of the WRI/WBCSD Scope 2 Guidance states, "This guidance does not require that contractual instruments claimed … fulfill criteria such as offset "additionality" or prove the overall market impact of individual purchases or supplier programs result in direct and immediate changes in overall supply." In other words, if ownership and retirement of a REC have been established, the REC can be applied to lower the owner's Scope 2 emissions. This applies equally to an organization that buys unbundled RECs, owns on-site generation and keeps the RECs, receives RECs bundled with a PPA, or engages in REC arbitrage.

Similarly, neither the CDP questionnaire scoring methodology nor the Science Based Targets Initiative provide "extra credit" for the impact a PPA has on increasing renewable generation. Rather, it is incumbent upon the buyer to tell the story of its leadership and impact.

How do companies and environmental groups view the leadership and impact value of PPAs?

Our collective experience at Edison Energy is that most of companies and institutions considering voluntary renewable energy procurements are interested in making a purchase that adds new renewable capacity to the U.S. generation fleet.

Leading companies such as Bloomberg, General Motors, Iron Mountain and The Home Depot (see Edison Energy case studies) have embraced the importance of impacting the electricity grid by ensuring their market participation adds incremental renewables to the grid.

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Over sixty-five companies have signed on to the WWF/WRI Corporate Renewable Energy Buyers Principles, the fourth principle of which states the signatories' desire to have "access to new projects that reduce emissions beyond business as usual … we would like our efforts to result in new renewable power generation."

While Greenpeace has argued that companies should source renewables from within their own regional grids to make credible environmental claims, this is not the prevailing view across the NGO spectrum nor the broader market.

Because it is impossible to track electrons once they are delivered to the grid, even if a wind facility were located on the same property as the buyer, absent a direct line connection between the generator and the buyer, the electrons being supplied could be coming from any of the generating sources on the same grid. Ideally, organizations would use what is called a "residual mix" factor, which is an average grid emissions factor that also considers ("backs out") all voluntary and compliance REC purchases to avoid double counting. Unfortunately, the U.S. EPA does not officially calculate a residual mix factor, therefore, the WRI/WBCSD protocol requires use of the grid average when calculating Scope 2 emissions.

Conclusion

Organizations increasingly want to demonstrate their sustainability leadership by clearly driving the construction of new renewable energy projects and accelerating the transition to a zero-carbon electricity grid. Unlike the purchase of RECs, either building onsite generation or entering a PPA with a yet-to-be-built renewable facility has a direct role in that facility's construction. While buyers now commonly refer to these actions in the market as having "additionality," the use of this term developed specifically to describe emissions reductions in the carbon offset markets creates confusion when applied to renewable energy.

Rather than risk conflating carbon offsets and renewables purchases, buyers should demonstrate leadership by considering and describing the impact their renewables purchase will have on building new generation and its potential to avoid emissions. At the same time, buyers must be both transparent and credible in telling their story, and be careful to specifically align their GHG claims with their contracts.

Buyers should demonstrate leadership by considering and describing the impact their renewables purchase will have on building new generation and its potential to avoid emissions.

The decision to enter a renewable energy PPA is a complicated one that combines many financial and sustainability criteria, and it is important to engage an unbiased advisor who can provide insight on the complete landscape and potential impacts of various scenarios. That way, when the final contract is signed, the buyer can credibly communicate to its stakeholders the impact it has had in supporting new renewable energy generation and the transformation of the electricity grid.

About the author

Timothy Juliani is Director of Corporate Engagement & Sustainability at Edison Energy. Tim engages with clients on their sustainability and renewable energy strategies and how they can achieve ambitious targets, improve reputation and manage risk. He writes on sustainability-related topics and works closely with Edison Energy's non-profit partners, including WRI and CDP.

Prior to Edison Energy, Tim spent over ten years at the Center for Climate & Energy Solutions (C2ES) and the Pew Center on Global Climate Change, where he directed the multi-sectoral Business Environmental Leadership Council, a group of 30+ Fortune 500 companies devoted solely to climate-related policy and solutions. He has also worked at the USEPA, where he launched the GreenChill voluntary corporate partnership program to reduce high global warming potential gases.

Tim earned an M.A. in International Economics, Energy and Environment from The Johns Hopkins School of Advanced International Studies (SAIS), and a B.A. in Religion, *magna cum laude*, from Middlebury College.

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5. While some experts do not agree that this is accurate carbon accounting, it is the prevailing best practice.
6. http://www.ghgprotocol.org/blog/top-ten-questions-about-scope-2-guidance
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8. https://www.green-e.org/docs/energy/Green-e%20Standard%20v3.1%20US.pdf https://www.epa.gov/greenpower/guide-purchasing-green-power
9. The Center for Resource Solutions, which certifies RECs under its Green-e Program, has published residual mix factors, but these only consider Green-e certified REC purchases. These numbers are only a fraction of the total RECs inventory in the United States, so the number is not recommended for use in carbon accounting.

Edison Energy is an independent energy advisory and solutions integration company with the capabilities to develop and implement a broad portfolio of energy services for commercial, industrial and institutional energy users. We help customers reduce their energy costs, improve the environmental performance of their operations, ensure energy resiliency and manage exposure to energy price risk.

Our Renewable Energy Advisory team helps organizations identify, analyze, and execute compelling on- and off-site renewable energy solutions.