Offsets and RECs: What's the Difference?

Introduction

In encouraging organizations to choose green power for their electricity, the Green Power Partnership frequently explains renewable energy certificates (RECs)—what they are, why they are needed for green power, and how they are used. Many Green Power Partners and Partnership stakeholders were familiar, at least conceptually, with offsets before learning about green power and RECs. It is common for RECs to be compared with offsets, thought of as a type of offset, or described as "offsetting" emissions. Offsets and RECs, however, are fundamentally different instruments.

Organizations working to lower their emissions footprint have a variety of mitigation options at their disposal, including activities to reduce their direct emissions, activities to reduce indirect emissions like energy efficiency measures and switching to green power, and paying for external reductions. Knowing the differences between instruments like RECs and offsets is critical to deciding how both may be useful to your organization.

What is a REC?

A renewable energy certificate – REC (pronounced: rĕk) is a tradeable, market-based instrument that represents the legal property rights to the "renewable-ness"—or non-power (i.e., environmental) attributes—of renewable electricity generation.

A REC is created for every megawatt-hour (MWh) of electricity generated and delivered to the grid from a renewable energy resource.

Electricity cannot be considered renewable without a REC to substantiate its renewable-ness.

This document explains what these two widely used instruments are, the differences between them, why and how an organization might use one or both, and common misconceptions.

To begin, this tables summarizes some of the basic differences between offsets and RECs.

Basic Differences	Offsets	RECs
Unit of Measure	Metric tons of CO_2 or CO_2 Equivalent	Megawatt hours (MWh)
Source	Projects that avoid or reduce greenhouse gas (GHG emissions to the atmosphere	Renewable electricity generators
Purpose	Represent GHG emissions reductions; provide support for emissions reduction activities; and lower costs of GHG emissions mitigation	Convey use of renewable electricity generation; underlie renewable electricity use claims; expand consumers' electricity service choices; and support renewable electricity development
Corporate GHG Inventories and Reporting	Reduce or "offset" an organization's scope 1, 2 or 3 emissions, as a net adjustment	Can lower an organization's gross market-based scope 2 emissions from purchased electricity
Consumer Environmental Claims	Can claim to have reduced or avoided GHG emissions outside their organization's operations	Can claim to use renewable electricity from a low or zero emissions source

Basic Differences	Offsets	RECs
Additionality Test Requirements	Required. Each project is tested for additionality to ensure that it is beyond business as usual. Tests include legal/regulatory, financial, barriers, common practice and performance tests. The combination of tests that is best suited to demonstrate additionality depends on the type of project.	Not required. Project additionality is not required for a renewable energy usage claim or to report use of zero-emissions power.

Many organizations start managing their footprint by developing a GHG emissions inventory. Under the WRI/WBCSD GHG Protocol[1], an organization follows a standard set of accounting guidelines to measure emissions and develop an emissions inventory that separately accounts for the emissions they are responsible for from their operations, energy purchases and supply chain in three different ledgers, known as scopes 1, 2, and 3.

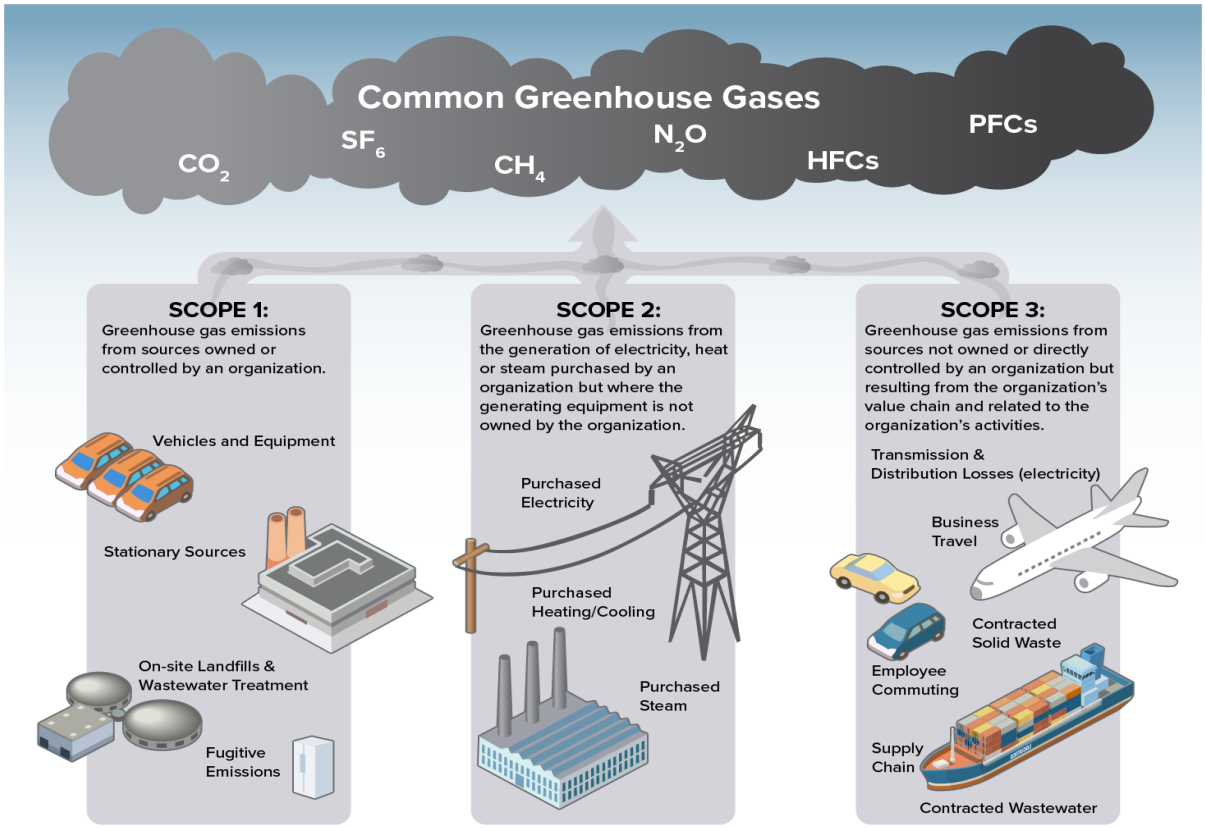

Figure 1. Common Sources of Emissions by Scope

The scopes help distinguish emissions from sources that the organization directly owns or controls (direct emissions) from emissions that are a consequence of the activities of the organization but occur at sources owned or controlled by another organization (indirect emissions). This separate accounting is to ensure that two or more organizations will not account for emissions in the same scope.[2] Through this framework, organizations can assess their performance and determine what mitigation options to pursue.

[1] http://www.ghgprotocol.org/

[2] http://www.ghgprotocol.org/corporate-standard, page 25

As mentioned above, those mitigation options can include the procurement of instruments, and the common instruments in the U.S. are:

- **Offsets** – used to address direct and indirect GHG emissions by verifying global emissions reductions at additional, external projects. Offsets (verified emissions reductions) are subtracted from organizational emissions to determine net organizational emissions.
- **RECs** – used to address indirect GHG emissions associated with purchased electricity (scope 2 emissions) by verifying use of zero- or low-emissions renewable source of electricity. RECs (MWh of renewable energy) are used in the calculations of gross, market-based scope 2 emissions based on the emissions factor of the renewable generation conveyed with the REC.

What is an Offset?

An offset project is "a specific activity or set of activities intended to reduce GHG emissions, increase the storage of carbon, or enhance GHG removals from the atmosphere."[3] The project must be deemed additional[4]; the resulting emissions reductions must be real, permanent, and verified; and credits (i.e, offsets) issued for verified emissions reudctions must be enforceable. The offset may be used to address direct and indirect emissions associated with an organization's operations (e.g., emissions from a boiler used to heat your organization's office building). The reduction in GHG emissions from one place can be used to "offset" the emissions taking place somewhere else. Offsets can be purchased by an organization to address its scope 1, 2, and 3 emissions. Offsets can be used in addition to an organization taking actions within its own operational boundary to lower emissions. Offsets are often used for meeting voluntary commitments to lower GHG emissions where it is not feasible to lower an organization's direct or indirect emissions.[5]

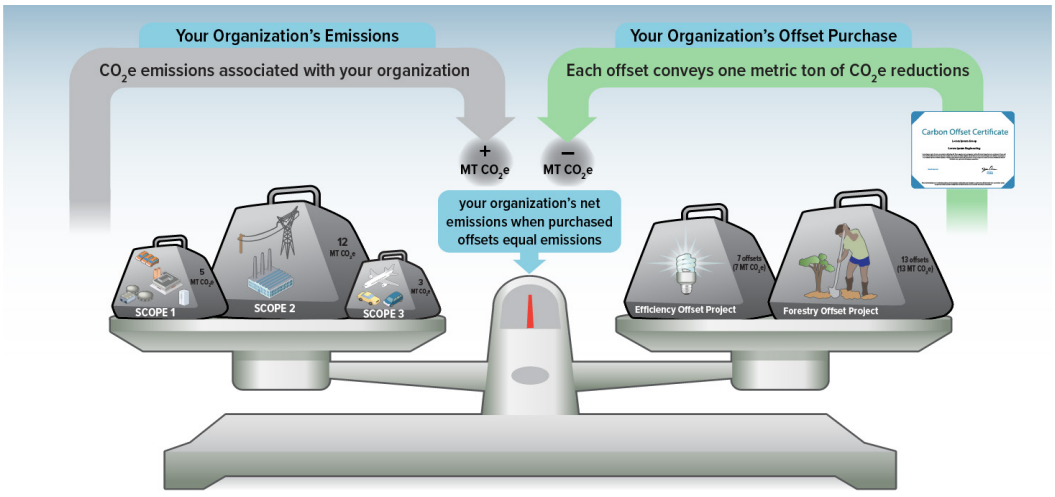

Figure 2. Offsets

An organization's emissions from scopes 1, 2, and 3 are balanced by purchasing offsets equal to the sum of the organization's emissions.

[3] http://www.ghgprotocol.org/standards/project-protocol, page 11, see "GHG Project"

[4] http://www.ghgprotocol.org/standards/project-protocol, page 15, see "2.14 Additionality"

[5] http://www.wri.org/publication/bottom-line-offsets

Why do Organizations Purchase Offsets?

For an organization with a voluntary commitment to reducing its emissions footprint, purchasing and retiring (that is, not re-selling) offsets can be a useful component of an overall voluntary emissions reduction strategy, alongside activities to lower the organization's direct and indirect emissions have been realized.[6]

What is a REC?

Renewable Energy Certificates (RECs) are the legal instruments used in renewable electricity markets to account for renewable electricity and its attributes whether that renewable electricity is installed on the organization's facility or purchased from elsewhere. The owner of a REC has exclusive rights to the attributes of one megawatt-hour (MWh) of renewable electricity and may make unique claims associated with renewable electricity that generated the REC (e.g., using or being supplied with a MWh of renewable electricity, reducing the emissions footprint associated with electricity use). Claims to the attributes of the electricity from a REC can only be made by one party. The purchase or use of renewable energy, verified with RECs, is a decision an organization makes to ensure its electricity is provided from renewable sources that produce low- or zero-emissions, thereby reducing the organization's market-based scope 2 emissions.[7] As the physical electricity we receive through the utility grid says nothing of its origin or how it was generated, RECs play an essential role in accounting and assigning ownership to the attributes of renewable electricity generation and use. RECs legally convey the attributes of renewable electricity generation, including the emissions profile of that generation, to their owner and serve as the basis for a renewable electricity consumption claim. As such, the REC owner has exclusive rights to characterize the quantity of their purchased electricity associated with the RECs as zero-emissions electricity.

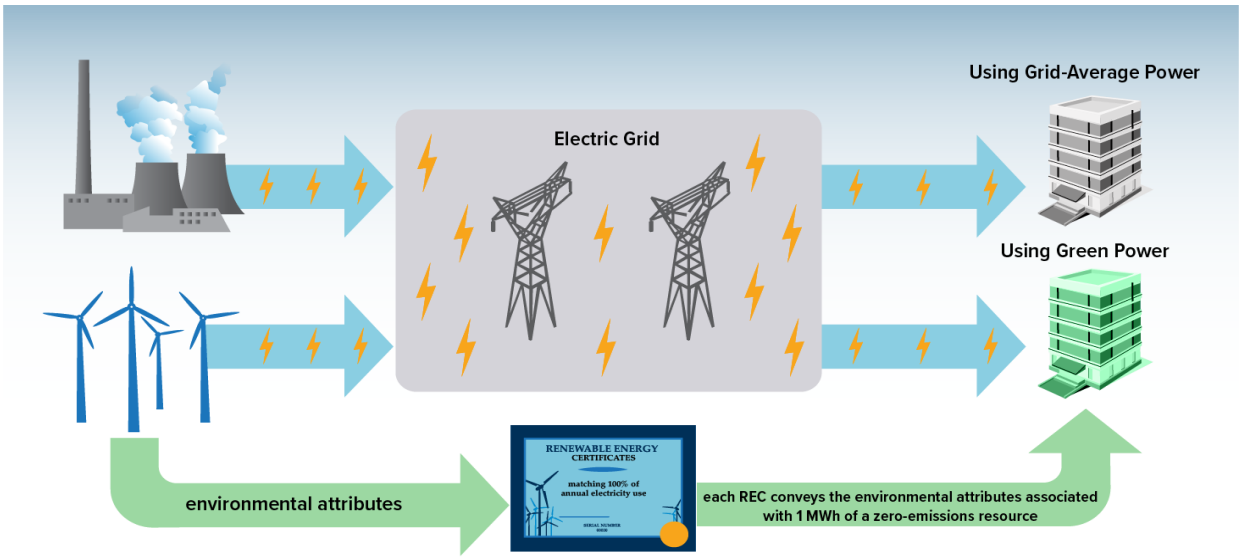

Figure 3. RECs

By purchasing RECs, an organization receives the rights to the environmental attributes of the renewable electricity and may make unique claims (e.g., using X MWh of green power) associated with the renewable electricity that generated the purchased RECs.

[6] http://www.wri.org/sites/default/files/pdf/bottom_line_offsets.pdf

[7] The *GHG Protocol Scope 2 Guidance* defines two methods for scope 2 accounting, the location-based method and the market-based method. The market-based method considers contractual arrangements under which the organization procures power from specific sources, such as renewable electricity.

Why do Organizations Purchase RECs?

RECs can be a flexible tool to help achieve clean energy goals, lower scope 2 emissions associated with purchased electricity, and support the renewable energy market. Though RECs are the essential accounting instrument required for all renewable energy usage claims, regardless of how renewable energy is purchased or consumed, RECs can also be purchased separately from electricity and independently matched with electricity consumption. This can be an attractive option for organizations in regions where renewable energy options, such as utility green pricing /marketing programs are not offered by local suppliers, where policy support for direct engagement in renewable energy projects is lacking, or where these other options are too expensive or not suited to the organizations size or needs. By purchasing RECs and electricity separately, organizations do not need to alter existing power contracts to obtain green power. Additionally, RECs are not limited by geographic boundaries or transmission constraints. For organizations with facilities in multiple states or energy grids, a single, consolidated REC procurement can be part of an organization's strategy to efficiently meet overall clean energy goals.[8]

RECs can be purchased from marketers or sometimes directly from renewable energy generators. Several REC marketers/environmental attribute brokers are active in REC markets, offering another approach to procurement that is increasingly being used by large purchasers. Brokers do not own the certificates but rely on their knowledge of the market to connect buyers and sellers for a fee. Brokers also aggregate and disaggregate supply into customized offerings that meet specific consumer needs. This includes breaking up output from very large projects into smaller bundles as well as aggregating smaller projects offtakes into larger consolidated bundles. They can help negotiate deals that take into account an organization's unique interests. For more information on purchasing RECs, see the Guide to Purchasing Green Power. [9]

Are Offsets and RECs the Same?

No. While both offsets and RECs can help an organization lower its emissions footprint, they are different instruments used for different purposes. Think of offsets and RECs as two tools in your sustainability tool box – like a hammer and a saw. They are not interchangeable. Each tool is used in building a house, but each is used to accomplish specific tasks. One is not more important or better than the other.

Using the term "offset" (even as a verb) when discussing your REC purchases can be confusing in the mind of many listeners – confusing the action of contractually fuel-switching to low- or zero-emissions electricity with having paid for a global emissions reduction. Rather than saying your purchase of RECs is offsetting your emissions, it would be better to claim that your purchase of RECs is renewable electricity from a low- or zero-emissions resource which reduces the emissions associated with your electricity use.

The major differences between these two instruments are:

- **Unit of Measure**: The unit of measure for an offset is typically one metric ton of CO2-equivalent emissions. A REC is based on 1 MWh of renewable electricity.
- **Purpose**: Offsets represent emissions reductions, provide support for emissions reduction activities, and may lower costs of GHG emission mitigation. RECs expand consumers' electricity service choices, convey environmental attributes and renewable electricity use claims, and support renewable electricity development.

[8] http://www.wri.org/sites/default/files/pdf/bottom_line_renewable_energy_certs.pdf

[9] https://www.epa.gov/greenpower/guide-purchasing-green-power

- **Source**: Offsets can come from all different kinds of projects that lower, remove or avoid emissions while RECs are only generated from renewable electricity sources (i.e., solar, wind geothermal, biomass, hydropower).
- **Claims**: A buyer of an offset can claim to have reduced or avoided direct GHG emissions outside their organization's operations. A buyer of a REC can claim to use 1 MWh of renewable electricity from a low- or zero-emissions resource. Purchasers of RECs should avoid confusing statements such as my purchase "offsets" emissions.
- **Accounting Guidance**: Offsets can be used to negate or "offset" an organization's scope 1, 2 or 3 emissions. Offsets are a separate line item intended to define a "net" emissions figure when documenting achievement of a target. RECs allow an organization to lower their market-based scope 2 emissions from purchased electricity.
- **Additionality**: Offsets must represent real, permanent, verified, and enforceable reductions. And most importantly, they must come from activities or project that are additional to what would occur under a business-as-usual scenario. This "additionality" requirement for offset projects is central to ensuring that the ton of emissions reductions you use as an offset is fully equivalent to a ton of emissions reductions from your operations. There is no requirement to demonstrate additionality when applying RECs to an organization's market-based scope 2 emissions. [10]

Summary

Both offsets and RECs represent the environmental benefits of certain actions that can help mitigate GHG emissions. Offsets represent a metric ton of emissions avoided or reduced; RECs represent attributes of 1 MWh renewable electricity generation. Offsets and RECs, however, are fundamentally different instruments with different impacts, representing different criteria for qualification and crediting in the context of inventory or emissions footprint.

[10] http://ghgprotocol.org/scope_2_guidance, page 90. The Project Protocol treatment for additionality does not require a demonstration of additionality for RECs. For more on regulatory additionality/surplus, page 2: https://resource-solutions.org/wp-content/uploads/2016/03/RECs-and-Additionality.pdf.