



EPA's Green Power Partnership Renewable Energy Certificates



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Many people and organizations are willing to pay for electricity that is produced on their behalf using cleaner, renewable sources of generation. These buyers often find renewable electricity attractive for its environmental and greenhouse gas reduction benefits when compared to conventional fossil fuel-based electricity generation.

Both individual and organizational buyers have several green power product options available. These include buying renewable energy certificates (RECs) by themselves, buying RECs along with physical electricity from their utility service provider, or developing onsite renewable projects that produce both electricity and RECs together. RECs in particular have become an important choice for buyers of green power nationwide and serve as the “currency” for renewable energy markets.

This document provides a review of RECs: what they are, how they work, and why they are an important option for individual and organizational buyers in renewable electricity and green power markets.





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Renewable Energy Certificates



What Are RECs?

RECs represent the environmental and other non-power attributes of renewable electricity generation and are a component of all renewable electricity products. RECs are measured in single megawatt-hour increments and are created at the point of electric generation. Buyers can select RECs based on the generation resource (e.g., wind, solar, geothermal), when the generation occurred, as well as the location of the renewable generator.

RECs provide key information about the generation of renewable electricity delivered to the utility grid. Since RECs represent only the environmental or non-power attributes of renewable electricity generation, they are not subject to electricity delivery constraints. The information conveyed by a REC allows buyers to make specific environmental claims about how their electricity is produced. RECs usually include the following primary attributes and information:

- The type of renewable resource producing the electricity
- The vintage of the REC (i.e., the date when it was created)
- The vintage of the renewable generator, or the date when the generator was built
- The renewable generator's location
- The RECs eligibility for certification or renewable portfolio compliance
- The renewable generation's associated greenhouse gas emissions (if any)

RECs are increasingly seen as the "currency" of renewable electricity and green power markets. They can be bought and sold between multiple parties, and they allow their owners to claim that renewable electricity was produced to meet the electricity demand they create.

A REC represents and conveys the environmental and other non-power attributes of one megawatt-hour of renewable electricity generation.

Increasingly, federal, state and local governments are also using RECs as a credible means to meet environmental goals for renewable energy generation. For example, most states allow utilities to use RECs to meet mandated state renewable portfolio standards. State renewable portfolio standards require that a percentage of a utility's electricity generation comes from renewable resources. Increasingly, individuals and organizations are also buying RECs to satisfy a number of other environmental and non-environmental goals:

- Avoid the carbon dioxide (CO₂) emissions associated with conventional electricity use
- Reduce some types of air pollution
- Hedge against future electricity price increases for onsite and some utility products
- Serve as a brand differentiator
- Generate customer, investor, or stakeholder loyalty and employee pride
- Create positive publicity and enhance public image
- Demonstrate civic leadership

How Do RECs Work?

To understand how RECs work, it is helpful to understand how electricity is delivered across the utility grid, as well as what makes renewable electricity generation attractive to individuals and organizational buyers.

Within the United States, electricity demand is met by various types of generation technologies and fuel resources. These electricity generators feed electrons onto the utility grid for delivery to consumers through a complex network of wires and distribution infrastructure. Because the electrons produced from the different technologies and fuel resources are physically the same, it is impossible for individuals or organizations to know what type of generation technology or resource produced the electricity that reaches their particular facility.

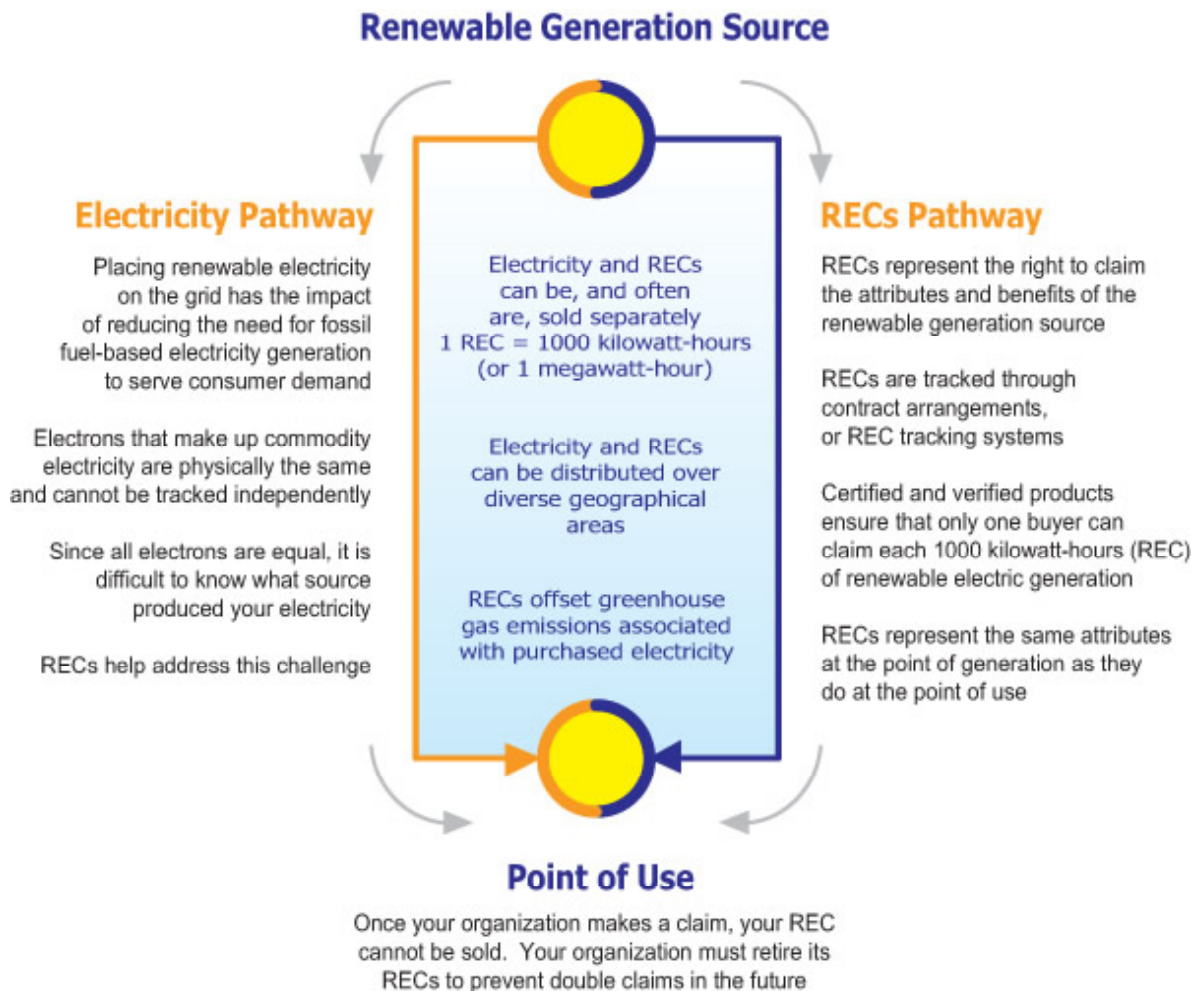
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RECs help address the issue that the electricity or electrons a consumer receives from their utility does not identify how the electricity was generated. RECs were created to help convey the attributes of electricity generated from renewable resources to buyers. Analogous to the utility delivering the physical electricity through wires, RECs serve as the means to deliver the environmental and non-power attributes of renewable electricity generation to buyers – separate from the physical electricity. (See Figure 1.) All renewable electricity generation can be viewed as having two separate parts:

1. The commodity electricity or electrons
2. The environmental and other non-power attributes of generation represented by a REC

Because RECs are monitored and verified, individuals and organizational buyers can buy RECs and be confident that electricity generated on their behalf was done so with renewable energy resources.

Figure 1



Why Are RECs an Important Option for Consumers?

Individuals and organizations may find that buying RECs separately from their electricity service is a useful way to tap into green power markets. More than half of U.S. electricity customers have an option to purchase some type of green power product from a retail electricity provider, but the rest do not have that choice. RECs provide buyers the option to select renewable resources to meet their electricity demand.

For example, in states that have restructured electricity markets, consumers can often buy green power products by switching electric service providers if their current provider does not offer a green power product. If consumers do not wish to switch electric service providers they also have the option to buy RECs separately from their existing electricity service. This approach allows buyers to avoid the environmental impacts of their electricity, since the REC represents a specific amount of avoided greenhouse gas emissions.

RECs can also be purchased in situations where a utility green power product is available, but this utility product does not have the desired environmental characteristics, resource base, or price. RECs provide more choices and more competitive prices because they are not constrained by where they are created or by transmission bottlenecks.

Who Owns a REC?

A REC can be bought and sold between buyers and sellers from its generation to its final point of application or use at a facility. Typically, regional tracking systems register RECs in order to keep track of how much renewable electricity was produced.¹ Tracking systems assign each REC a unique number, which matches the REC to its current owner. Alternatively, buyers can use third-party audits to confirm the contractual chain of ownership between multiple parties. REC contracts typically include a statement, or attestation, from the seller that the RECs have not been sold to, and cannot be claimed by, another party.

What Is the Difference between Renewable Electricity and Green Power?

Renewable electricity is produced from resources that do not deplete when their energy is harnessed, such as sunlight, wind, waves, water flow, biological processes such as anaerobic digestion (e.g., landfill gas), and geothermal energy. Renewable electricity resources are distinct from fossil and nuclear fuels, which are also used to generate electricity.

EPA defines green power as a subset of renewable electricity and represents those renewable resources and technologies that provide the highest environmental benefit. Green power is renewable electricity produced from solar, wind, geothermal, biogas, biomass, and low-impact small hydroelectric resources. Definitions for renewable energy can vary and may include resources that are acknowledged or perceived to have environmental impacts, such as land use and fisheries impacts of large hydro dams.

RECs are a credible and easy way to keep track of who can claim the environmental attributes of renewable electricity generation through electronic tracking systems. Because RECs are carefully counted, tracked and associated with an owner, no two buyers can legally claim the same environmental benefits of the renewable electricity generation.

Once a buyer makes an environmental claim based on a REC, the buyer can no longer sell the REC and the REC is considered permanently “retired.” Buyers can also have their RECs retired in their name by their supplier to ensure that no other entity can lay claim to the same environmental benefits.

¹ Regional tracking systems have been put in place to monitor electricity generation across the United States. A REC is produced for every megawatt-hour of electricity generated from a renewable resource and is assigned a tracking number within the system. The tracking number stays with the REC and is transferred between buyers and sellers until a final owner makes a claim, at which time the REC is considered “retired” in the system.

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Consumers or organizations with onsite renewable electricity systems should be clear about who owns the RECs produced by the onsite system. If the onsite system owner wants to make an environmental claim about the use of renewable electricity from the onsite system, they should ensure that they have and retain ownership of the RECs produced by the onsite renewable electricity system. If the onsite system owner uses the system-produced electricity, but sells the RECs to another party, they are no longer using green power and cannot make a claim to be doing so.

Are There Standards for RECs?

There are a number of third-party organizations in the market that certify RECs. As a best practice, EPA recommends that buyers seek out certified products as a form of buyer protection. Certified RECs should meet national standards for resource content and environmental impact. Certification answers the question “Does this product meet accepted standards for quality?”

Who Sells RECs?

RECs and the attributes they represent are an ingredient of all green power products. REC providers—including utilities, REC marketers, and other third-party entities—may sell RECs alone or sell them bundled with electricity. As of 2007, more than 50 percent of utility customers have access to green power bundled products, whereas all customers have access to buying renewable energy certificates.

Buyers can identify green power suppliers using EPA's Green Power Locator tool: www.epa.gov/greenpower/pubs/gplocator.htm

Green Power Product Provider/Source	Geographic Availability	Renewable Energy Certificate	Physical Electricity
REC Marketers	Nationally Available	✓	
Utility Green Pricing Programs	Unrestructured Electricity Markets	✓	✓
Utility Green Marketing Programs	Restructured Electricity Markets	✓	✓
Onsite Renewable Electricity Systems	Any Grid-Connected Point of Use	✓	✓