



## EPA's Green Power Partnership

### The Environmental Value of Purchasing Renewable Energy Certificates Voluntarily

Discussion Draft



**D**ramatically increasing the use of renewable energy in the nation's electricity generation portfolio is essential to reducing U.S. greenhouse gas (GHG) emissions. For most organizations, the use of electricity might be the largest single source of GHG emissions for which they have responsibility. Therefore, the purchase of zero-emission, renewable electricity is an excellent way to help make the transition to more renewable energy and a reduced carbon footprint. Thousands of organizations are leading this effort by installing their own renewable energy systems or purchasing renewable electricity. Among these organizations, many have found that purchasing renewable energy certificates (RECs) is one of the simplest and most effective ways to reduce their carbon footprint.

RECs are critical, effective, and valuable instruments for expanding renewable energy across the United States. With RECs, electricity customers anywhere in the United States can buy renewable electricity regardless of whether it is offered by their local electricity provider. RECs' flexibility is a key factor in the emergence of a commercial and institutional customer-driven national voluntary market for renewable energy. Voluntary market sales grew four-fold in four years—from 6 billion kilowatt-hours (kWh) in 2004 to 24 billion kWh in 2008—largely because of organizational demand for RECs. Of the total voluntary market sales in 2008, two-thirds were RECs (the remainder were utility green power products).<sup>1</sup>

The purpose of this paper is to educate U.S. Environmental Protection Agency's Green Power Partners and prospective Partners about the environmental value of purchasing RECs voluntarily. To clarify the basis for this environmental value, this paper addresses: the role of RECs in the renewable energy marketplace, their role in reducing emissions, and the manner in which a corporate GHG inventory accounts for the environmental value of a voluntary REC purchase.

## The Role of RECs in the Renewable Energy Marketplace

RECs were introduced in the late 1990s to verify consumer electricity labels and renewable portfolio standards (RPS) compliance, and to provide flexibility for RPS compliance. Today, they stimulate renewable energy development by giving generators and consumers access to broader markets than just their interconnected utilities.

RECs are market-based instruments that convey the environmental value of renewable energy between buyers and sellers. Each REC provides exclusive proof that 1 megawatt-hour (MWh) of renewable energy has been generated.<sup>2</sup> RECs are widely used to verify compliance with state renewable portfolio standards and to establish environmental claims in the voluntary market. As such, they are the common currency in both compliance and voluntary markets.

REC trading enables a national voluntary market for renewable energy that facilitates both supply-side efficiency—developers can site renewable energy facilities where the resource is most cost-effective—and customer choices—organizations can design a green power purchase that meets their specific criteria mix of geographic location, technology type, supplier, facility vintage, and price. Many of EPA's Green Power Partners make sophisticated purchasing decisions with RECs, accessing desirable projects and satisfying cost and technology objectives.

EPA regards REC purchasing as the simplest way for organizations and institutions to affect the United States' electricity generation mix at a national scale. These voluntary purchases create demand that is over and above the demand created by the compliance requirements of state RPSs and allow organizations of all sizes to leverage their collective purchasing power to positively influence utility-scale generation.<sup>3</sup> As a result of this flexibility, voluntary demand for new renewable energy is currently roughly equivalent in size to the demand for new generation created by the compliance requirements of existing state RPSs.<sup>4</sup>

1 Bird, Lori, Claire Kreycik, and Barry Friedman, *Green Power Marketing in the United States: A Status Report* (2008 Data), National Renewable Energy Laboratory, United States, 2009, p. 4, <http://www.nrel.gov/docs/fy09osti/46581.pdf>.

2 A certificate tracking system issues a uniquely numbered certificate for each MWh of electricity generated by a generation facility registered in the system, tracks the ownership of certificates as they are traded, and retires the certificates once they are used or claims are made based on their attributes or characteristics. For more information, see the EPA Green Power Partnership's REC Tracking Web page (August 2010): <http://www.epa.gov/greenpower/gpmarket/tracking.htm>.

3 RECs sold into the voluntary market cannot also be used in the compliance market. If the voluntary market buys all of the RECs intended for a state's RPS, new supply will have to be created to meet the mandates. This gives the voluntary market an inherent degree of additionality.

4 Bird, et al., 2009, pp. 6–7.

It is worth noting that RECs and utility green power are fundamentally equivalent environmental products. Utility green power is a type of product offered by many electric service providers that combines electricity with RECs. It is functionally the same as buying RECs separately. A customer purchasing green power from a utility-owned wind farm is unlikely to receive the electrons that were generated at the wind farm because electrons flow to the nearest point of use. The customer in this example is receiving RECs, albeit from a specific and, in some circumstances, proximate facility.

When RECs are sold separately from electricity, then the underlying electricity is no longer considered “renewable” or “green.”<sup>5</sup> Users of that electricity cannot claim to be buying or using green power in the absence of owning the REC. This prevents double-counting of environmental benefits.<sup>6</sup>

While RECs convey the environmental value of renewable energy between buyers and sellers, REC prices are not based solely on cost. The prices vary over time based on supply and demand—including mandated RPS demand—and other dynamic factors such as wholesale power prices, capital costs, and the availability of credit and government incentives. As a result, a REC’s price is not a true or accurate reflection of its environmental value.

## The Role of RECs in Reducing GHG Emissions

RECs have historically been thought of as an important additional incentive, often necessary to turn an uneconomical project into a viable one. Recently, questions have arisen as to whether RECs are truly an integral component of project economics. For project developers, RECs represent an additional revenue source: a wind farm, for instance, will produce two

saleable products—electrons and RECs. This added revenue helps developers recover costs, pay off debt, and reduce project risk. Increased demand for RECs will help developers to pay for new projects, which influences the mix of resources used to generate electricity. Purchasing RECs through long-term contracts is even more desirable for project developers because such contracts further reduce risk and uncertainty.

Generally speaking, new renewable electricity facilities deliver electricity that affects the order in which existing facilities generate electricity for the grid and the future plans for fossil-fueled generators. As a result of bringing new renewable electricity facilities online, the electricity sector emits fewer tons of carbon dioxide emissions than it would have if these renewable energy sources had not been operating or built.

EPA periodically updates regional grid emission factors to account for these changes in the generation resource mix. At present and in spite of significant voluntary market growth, renewable energy growth attributable to voluntary purchases still represents a small percentage of the total supply portfolio. EPA anticipates future updates when emission factors will have to be adjusted to account for such growth.<sup>7</sup>

## RECs and Corporate GHG Accounting

An organization buying RECs can claim to be buying zero-emission, renewable electricity, which reduces or avoids its indirect emissions from purchased electricity.<sup>8</sup> Another way to express the benefit is as a reduction in the organization’s carbon footprint.<sup>9</sup> EPA guidance and existing voluntary corporate GHG accounting rules support these claims.<sup>10</sup>

5 Electricity without its environmental attributes is commonly called null power, which conveys no contractual rights or claims. See: Environmental Tracking Network of North America, *The Intersection between Carbon, RECs, and Tracking: Accounting and Tracking the Carbon Attributes of Renewable Energy*, February 2010, <http://etnaa.org/images/PDFs/Intersection%20btwn%20Carbon%20RECs%20and%20Tracking.pdf>.

6 For more information about RECs and other green power product options, see: U.S. Environmental Protection Agency, U.S. Department of Energy, World Resources Institute, and Center for Resource Solutions, *Guide to Purchasing Green Power*, [http://www.epa.gov/greenpower/documents/purchasing\\_guide\\_for\\_web.pdf](http://www.epa.gov/greenpower/documents/purchasing_guide_for_web.pdf).

7 According to Bird, et al. (2009, p. 3), retail sales of renewable energy in voluntary purchase markets exceeded 24 billion kWh in 2008, or about 0.6 percent of total U.S. electricity sales. This includes sales of renewable energy derived from both “new” and “existing” renewable energy sources, consistent with the generally accepted market definition with most sales supplied from new sources.

8 Indirect emissions come from sources that an organization does not own but that are associated with its activities. This is distinguished from reducing direct emissions that result in reducing global or total atmospheric emissions. See Table 1.

9 Some GHG voluntary reporting programs use the terminology of “using zero-emission electricity” rather than “reducing or avoiding indirect emissions.” Either way, both result in adjustments to the purchasing organization’s scope 2 emissions.

10 These claims are supported by the World Resources Institute and World Business Council for Sustainable Development (*Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* [Revised Edition], p. 61, <http://www.ghgprotocol.org/standards/corporate-standard>), as well as EPA’s voluntary GHG reporting and goal-setting guidance and the U.S. Council on Environmental Quality (*Federal Greenhouse Gas Accounting and Reporting Guidance*, [http://www.whitehouse.gov/sites/default/files/microsites/ceq/GHG%20Guidance%20Document\\_0.pdf](http://www.whitehouse.gov/sites/default/files/microsites/ceq/GHG%20Guidance%20Document_0.pdf)). The Climate Registry (<http://www.theclimateregistry.org/downloads/2010/08/Draft-Climate-Registered-Leadership-Program-Reporting-Requirements.pdf>) has a draft policy for its Climate Registered Leadership program that is also consistent with these claims, but it has not been finalized at this time.

Most leading organizations and businesses that are tracking the GHG emissions associated with their operations are doing so through established voluntary GHG reporting programs. While accounting methodologies might vary slightly, most programs follow the framework provided by the internationally accepted World Resources Institute and World Business Council for Sustainable Development Greenhouse Gas Protocol Corporate Standard. According to this standard, when reporting emissions to a GHG inventory, organizations classify emissions into three scopes, as shown in the first two columns of Table 1. The remainder of Table 1 is EPA's interpretation of how these scopes may be used.

This classification recognizes that emissions (and emission reductions) are rarely the responsibility of just one entity's operations. The different scopes enable all of the entities involved to report the emissions associated with their operations and to take

actions to reduce them. According to accounting rules, the same emissions may be claimed by more than one entity as long as the emissions are claimed in different scopes. Double counting of emissions would occur only if more than one entity claimed the same emissions in the same scope.

Voluntary RECs might be confused with voluntary carbon offsets.<sup>12</sup> RECs are not offsets. The differences between the two environmental instruments prevent them from being used interchangeably,<sup>13</sup> though both may be useful in achieving organizations' net GHG reduction goals.

The purchase of RECs or green power is reflected as an adjustment to scope 2 emissions. Scope 2 accounts for the GHG emissions from the mix of regional generation resources used to generate the MWh of purchased electricity. The adjustment methodology depends on the specific GHG voluntary reporting program. In EPA's voluntary GHG reporting and goal-setting

**Table 1. Scopes for Corporate GHG Accounting and EPA's Interpretation of Their Use**

Scope	Description	Applicability		Allowable Reduction Claims
		RECs	Offset	
Scope 1 (Direct Emissions)	Emissions from sources that the organization owns or controls, such as industrial processes, natural gas consumption in buildings, owned vehicles, and owned energy generators <sup>11</sup>	No	Yes	Total GHG emission reductions; direct emission reductions
Scope 2 (Indirect Emissions)	Emissions associated with the generation of electricity, steam, or heat—from sources that the organization does not own—that is purchased and consumed by the organization	Yes	Yes	Carbon footprint reductions; indirect emission reductions
Scope 3 (Other Indirect Emissions)	Emissions from other sources the organization does not own or control; examples include waste disposal, leased/outsourced activities, business travel, and employee commuting	No	Yes	Carbon footprint reductions; indirect emission reductions

11 On-site generators owned by the reporting entity should report direct emissions in scope 1. The owners of such on-site generators that displace purchased electricity should also report the emission reductions as an adjustment to scope 2 emissions.

12 A GHG or "carbon" offset is a unit of carbon dioxide-equivalent (CO<sub>2</sub>e) that is reduced, avoided, or sequestered to compensate for emissions occurring elsewhere. Goodward, Jenna, and Alexia Kelly, Bottom Line on Offsets, World Resources Institute, August 2010, <http://www.wri.org/publication/bottom-line-offsets>. Offsets are generated by investing in projects that result in verifiable emission reductions or in removing GHGs from the atmosphere. U.S. Environmental Protection Agency, *Climate Leaders Greenhouse Gas Inventory Protocol Design Principles*, 2005, p. 45, <http://www.epa.gov/climateleaders/documents/resources/design-principles.pdf>.

13 Direct emission reductions resulting from voluntary REC purchases are typically realized at conventional power generation facilities owned by entities other than the REC owner or generator. However, REC purchasers do not have clear title to direct emission reductions because green power or REC contracts typically do not include conventional power generation facilities displaced by renewable energy generators as a third party to the agreement. As a result, the role of RECs in reducing an organization's GHGs is limited to indirect emissions (i.e., scope 2). U.S. Environmental Protection Agency, *Climate Leaders Greenhouse Gas Inventory Protocol Optional Modules Methodology for Green Power and Renewable Energy Certificates*, 2008, p. 4, [http://www.epa.gov/climateleaders/documents/greenpower\\_guidance.pdf](http://www.epa.gov/climateleaders/documents/greenpower_guidance.pdf).

guidance, an organization purchasing RECs calculates its net emissions by estimating the avoided emissions associated with its green power purchase<sup>14</sup> using regional marginal emission factors, which is advised by most GHG registries when facility-specific emission information is not available.<sup>15</sup>

It is worth emphasizing that using RECs to adjust scope 2 emission levels is consistent with, not an exception to, general scope 2 accounting rules. Scope 2 was specifically designed to recognize the importance of demand-side actions in reducing electricity sector emissions (as well as emissions related to purchased or imported steam or heat).

The enactment of climate regulations might necessitate changes to voluntary REC definitions and to corporate GHG accounting rules, but any changes would depend on the details of the specific regulations adopted. EPA and other experts agree that it will still be valuable for organizations to take actions to reduce the emissions associated with their purchased electricity, and it is possible that voluntary RECs would continue to offer organizations a means to reduce their carbon footprint over and above a regulatory baseline.

## Conclusion

Voluntary RECs offer critical environmental value because they capture and enable the trade of the specific environmental benefits associated with renewable energy generation. RECs create an accessible and more efficient national voluntary market for renewable energy and provide an additional revenue stream for renewable energy project developers. Deploying renewable sources of energy is critical for reducing our nation's carbon emissions. The voluntary purchase of RECs allows businesses and individuals to help grow U.S. renewable energy capacity in a way that is most cost-effective and efficient for the economy and offers a compelling, verifiable, and transparent way for an organization to meet its environmental goals.

EPA supports organizations purchasing RECs that meet the Green Power Partnership eligibility criteria<sup>16</sup> and encourages them to use their purchases to adjust their indirect GHG emissions and to claim a smaller carbon footprint.

<sup>14</sup> To learn how emission reduction claims are quantified, see Greenhouse Gas Protocol Initiative, Indirect CO<sub>2</sub> Emissions from the Consumption of Purchased Electricity, Heat, and/or Steam: Guide to Calculation Worksheets (v. 1.2), January 2007, [http://www.ghgprotocol.org/calculation-tools/downloads/downloads-registration?referred\\_from=/downloads/calcs/ElectricityHeatSteamPurchase\\_guidance1.2.pdf](http://www.ghgprotocol.org/calculation-tools/downloads/downloads-registration?referred_from=/downloads/calcs/ElectricityHeatSteamPurchase_guidance1.2.pdf); and U.S. Environmental Protection Agency, *Climate Leaders Greenhouse Gas Inventory Protocol Optional Modules Methodology for Green Power and Renewable Energy Certificates*. 2008. [http://www.epa.gov/climateleaders/documents/greenpower\\_guidance.pdf](http://www.epa.gov/climateleaders/documents/greenpower_guidance.pdf).

<sup>15</sup> U.S. Environmental Protection Agency, 2008, p. 4.

<sup>16</sup> For more information, see: U.S. Environmental Protection Agency, EPA's *Green Power Partnership's Partnership Requirements*, May 2010, [http://www.epa.gov/greenpower/documents/gpp\\_partnership\\_reqs.pdf](http://www.epa.gov/greenpower/documents/gpp_partnership_reqs.pdf).