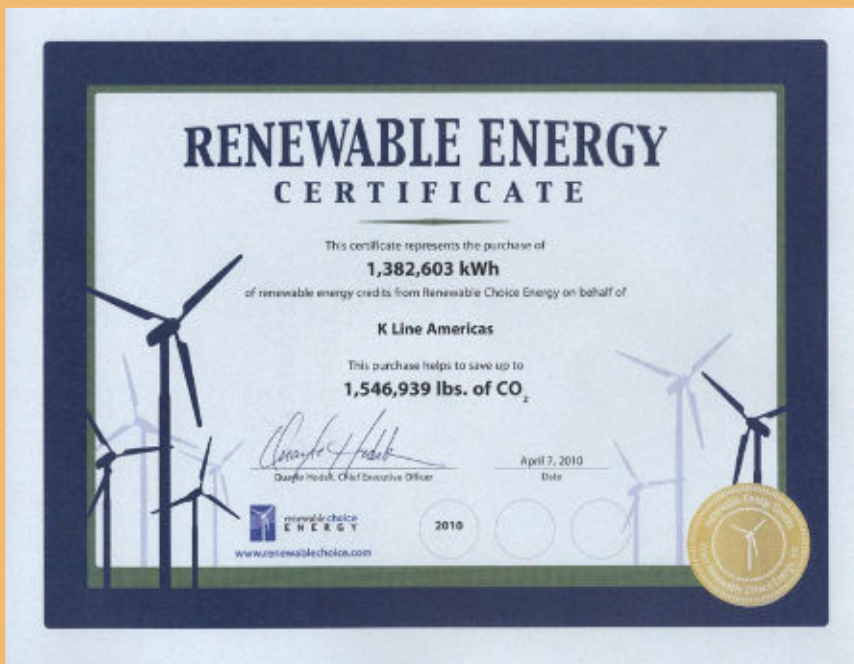


Renewable Energy Procurement

# What the Heck is a REC?



## And Why It Matters

By Dan Pinkel and Al Weinrub  
2nd Edition, October 2013



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## Acknowledgements

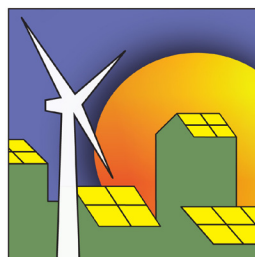
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*Note: Readers are encouraged to provide feedback on this document so that it can be revised to better meet the needs of the advocacy community. Please submit comments to Al Weinrub, Coordinator of the Local Clean Energy Alliance, at [al.weinrub@comcast.net](mailto:al.weinrub@comcast.net)*

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# Introduction

This paper is meant to be useful to clean energy advocates by providing information about California's renewable energy requirements and the use of Renewable Energy Certificates (RECs)—sometimes called Renewable Energy Credits—to meet them. The information is relevant to other states, as well.

The information is particularly important for advocates of Community Choice energy programs. Community Choice energy, provided for by California's AB 117 (2002), enables cities and other jurisdictions to choose where the electricity provided to their residents and businesses will come from. This means that local communities can decide to procure their electricity from renewable energy sources: either by purchasing renewable electricity on the market, or more importantly, by developing local renewable energy resources in the community. Under a Community Choice energy program, the incumbent investor-owned utility company continues to deliver electricity and service customers.\*

A Community Choice energy program, even one prioritizing the development of local renewable energy resources, needs to purchase electricity on the market as it builds local energy efficiency and new generating assets. Throughout its development the program must comply with the California Renewables Portfolio Standard (RPS), which specifies the proportion of electrical energy sold that must come from qualifying (RPS-eligible) renewable sources.<sup>1</sup>

Furthermore, California, like other states, has mandated that compliance with its RPS be documented through the use of RECs, and has set particular criteria that RECs must meet to count toward satisfying greenhouse gas reduction goals. As we discuss below, there are substantial differences among RECs, and their impact on renewable energy development can be highly variable, especially for RECs that do not qualify as meeting state RPS criteria.

Meeting, or even exceeding, RPS requirements is measured by tracking RECs through various kinds of transactions. Hence an understanding of the RPS, RECs, and their relationship is needed in advocating for, designing, or evaluating Community Choice or other procurement programs. The same general considerations apply to evaluating renewable energy claims of utility companies and other electricity providers, both in California and in other states as well.

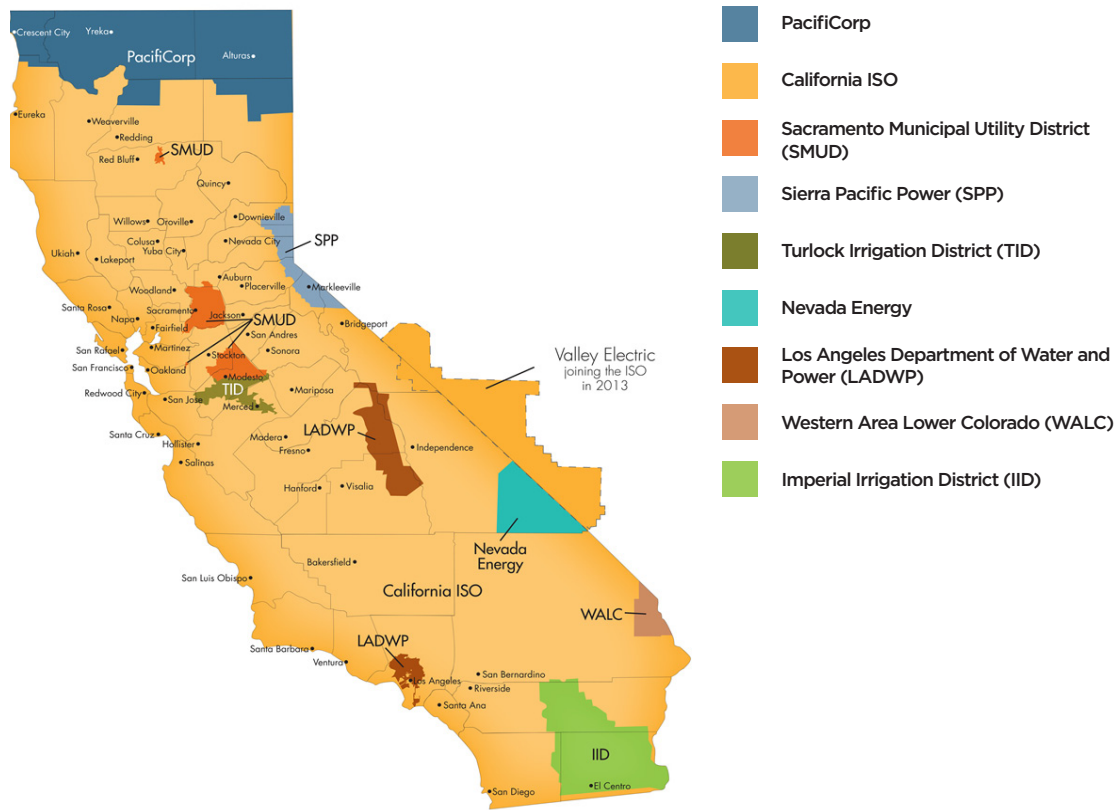
## *Electricity Distribution in California*

Provision of electrical energy to end users is complex, requiring the matching of supply from multiple sources to demand as both vary significantly throughout the day, the seasons, and in response to changing weather. Generation and consumption must be matched moment by moment although large-scale storage can be used to balance supply and demand.†

In California the matching is accomplished by a number of California Balancing Authorities (CBAs) that serve different geographical areas,<sup>2</sup> as shown in Figure 1 on the following page.

\* For more information, see <http://www.localcleanenergy.org/policy-platform/communitychoiceenergy>.

† In California, for example, there is about 4,000 MW of large-scale pumped water storage, which is dedicated to matching nuclear power production to electricity demand. For renewable energy generation, which is generally intermittent, storage can play an essential role in matching supply with demand.

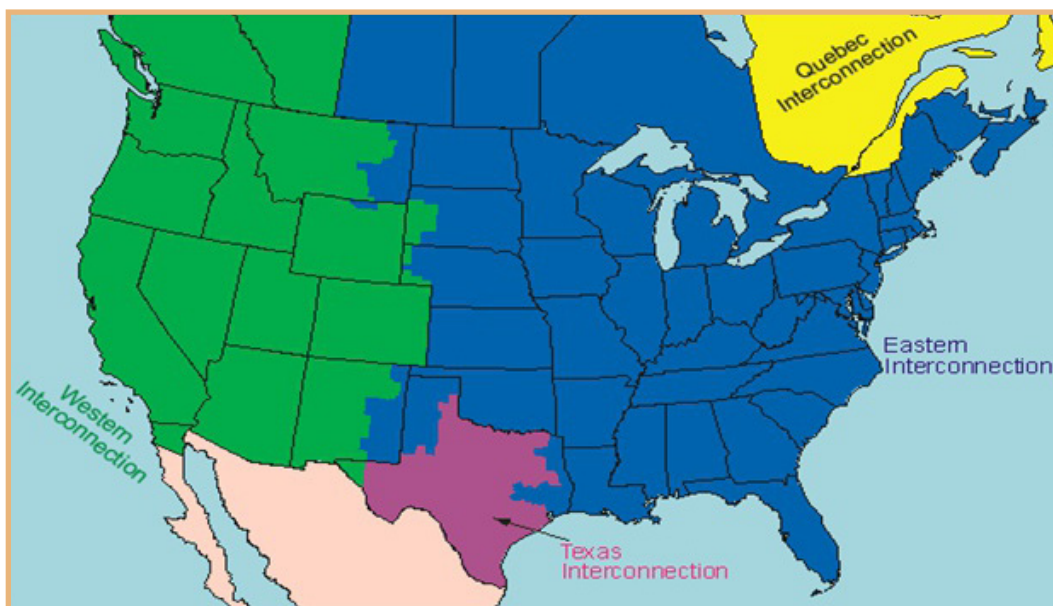


**Figure 1:**  
**California Balancing Authorities (CBAs)**

*Note: For purposes of RPS compliance, only balancing authorities primarily located in California are considered "California Balancing Authorities." Hence, Pacificorp, WALC, SPP, and Nevada Energy are not included in RPS compliance.*

One CBA, the California Independent Systems Operator (CAISO), covers most of the area of the state, including the Bay Area. The CBAs coordinate the scheduling of electrical generation sources within their areas (no matter who owns them), transfer power from one to another through the electrical grid, and provide electricity and other services to load-serving entities that deliver power to end users—for example, publicly-owned utilities and investor-owned utilities.

California is also connected more broadly to a grid, the Western Interconnection,<sup>3</sup> encompassing the the Western US and Canada, shown in Figure 2, through which the state can supply and receive power. This entire system is governed by a complex State and Federal legal and regulatory structure.



**Figure 2:**  
**North American Power Grids**

# Renewable Energy Certificates (RECs)

Figuring out how much renewable energy a load-serving entity supplies to end users is not as simple as it might seem.

Electricity from all sources is physically identical and can not be distinguished at the point of use as coming from one source or another. Determining the mix of sources and the amount of electrical energy each source provides—the energy portfolio—requires carefully tracking information about the purchase of energy from various sources.

Each generating source has its own characteristics, including environmental and health impacts. Understanding the implications of an energy portfolio therefore requires a nuanced and specific analysis of generating sources. The designation of a source as “renewable” or “non-renewable” represents only one level of classification. RECs are the accepted mechanism for tracking actual characteristics of generating sources that claim to provide renewable electrical power.

## Why Do We Need RECs?

The growing movement to increase the use of renewable energy, expressed in various laws and individual preferences, has resulted in development of RECs to keep track of many highly variable attributes of renewable power sources.<sup>4</sup> Each REC represents a set of attributes (such as type of generation, facility location, date the facility went into service, date of generation of the power, and so forth) of 1 Megawatt-hour (MWh) of renewable electricity. Thus a renewable energy generator actually produces both a quantity of electrical energy and its associated RECs.

RECs can be bundled with the power they represent and included with the sale of that power or they can be unbundled and sold separately from the power, as shown in Figure 3.

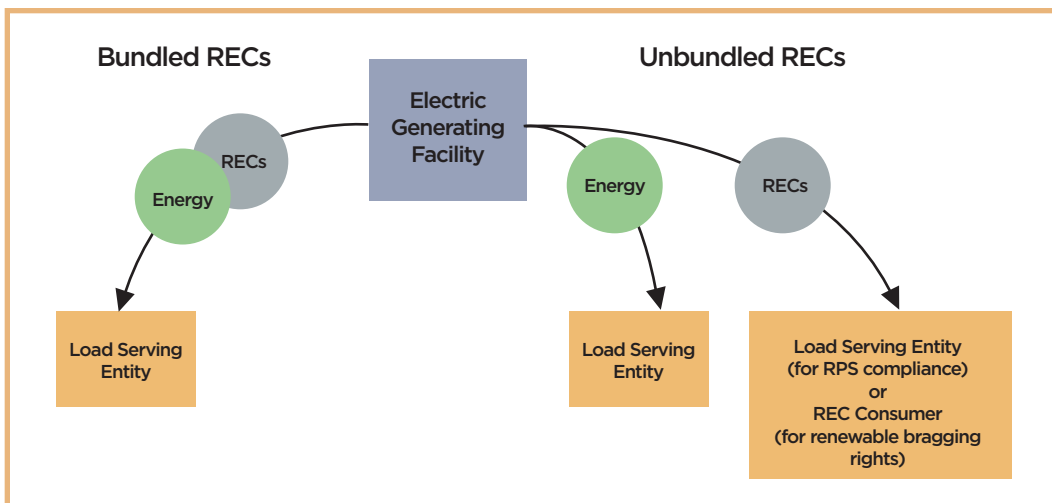


Figure 3:

*Bundled and Unbundled RECs Compared*

Note that if the RECs are unbundled and sold separately, then the purchaser of the RECs has bought the legal right to the renewable attributes they represent. This means that the energy originally associated with the RECs can no longer be considered renewable or to originate from a renewable source. For example, if homeowners were to sell the RECs associated with the energy generated from their rooftop solar PV installations, then those homeowners can not legitimately claim to be using renewable power in their homes. Only the purchaser of the RECs can make that claim.

The choice by an electricity generator as to whether to bundle or unbundle RECs reflects the fact that RECs are used in two ways. One, which is firmly established, is as an accounting mechanism to track compliance with state renewable energy standards. The other, which is very controversial because of its highly variable

effectiveness, is based on the sale and purchase of unbundled RECs to provide critical financial stimulus for the development of new renewable electricity generation.

## Why Unbundle RECs?

*Here are two situations in which an electricity generator might unbundle RECs to sell them separately on the market:*

- The generator is located in a state in which load-serving entities have already met state renewable energy standards and therefore do not want to pay for additional renewable energy. The RECs are unbundled and sold, presumably where there is a scarcity of renewable energy, for a premium price.*
- Solar PV leasing companies often retain the rights to RECs under lease agreements they sign with building owners. The electricity is consumed by the building, but the RECs are sold by the leasing company as a source of additional revenue.*

## What Determines the Value of a REC?

Renewable energy has environmental and social value—and, ultimately, economic value—because it replaces fossil fuels. Similarly, a REC has value to the extent it represents the replacement of fossil-fuel electricity generation by new (or additional) renewable energy sources.

Another way of saying this is that a REC has value when income from the sale of the REC (whether bundled or unbundled) makes it financially viable for an electricity supplier to generate electricity from a renewable energy source that would otherwise be too costly. In a similar vein, the purchase of a REC can be said to offset fossil-fuel sources of power only if the REC represents additional renewable generation made possible by that financial transaction. In essence, this additionality is what determines the value—or quality—of a REC.

In monetary terms this means that ideally speaking the price of a REC should reflect the difference between the cost of electricity generated from a new renewable source compared to electricity from a non-renewable source. However, as we shall see, this is not always the case; the price of a REC often depends more on market conditions than the quality of the REC.

## RECs for California's RPS Compliance

California and approximately 30 other states have implemented programs that require a switch to renewable electrical energy sources over time.<sup>5</sup> The requirements for most of these programs are expressed in terms of an RPS. Currently the requirement in California is to have 33% of the electrical energy sold in the state come from renewable sources by 2020.

## Compliance Monitoring

Compliance with California's RPS goals is monitored through RECs. On defined dates entities that provide electrical power to end users must present RECs to state regulators to demonstrate compliance with the RPS standards then in force. The attributes of these "compliance" RECs are defined by state legislation and related interpretive decisions of the California Public Utilities Commission.<sup>6</sup>

By state law, California uses RECs that are tracked by the Western Renewable Energy Generation Information System (WREGIS).<sup>7</sup> WREGIS transfers RECs from the accounts of sellers to buyers, and does the accounting to be sure that each REC can be claimed—or retired—by only one party.

Since California currently falls short of the renewable generation capacity to meet the state's 2020 goals, the RPS compliance system drives the building of additional renewable generating capacity. The compliance requirements are tightened over time, with the goal of providing a reliable energy supply as renewable generation is increased.

## Compliance Phasing

In December 2011 the California Public Utilities Commission issued the rules governing the use of RECs to meet the 33% RPS target.<sup>8</sup> This decision basically refined the three "portfolio content categories" of renewable electricity prescribed by state law. The detailed definitions of these categories are complex,<sup>9</sup> but summarized in Table 1 and as follows:

- **Category 1** (Bundled electricity): This category consists of RPS-eligible renewable electricity bundled with the corresponding RECs.
- **Category 2** (Firmed and Shaped electricity): This category consists of electricity and RECs that cannot be delivered to a California Balancing Authority without occasionally substituting energy from non-renewable sources (a process called firming and shaping). This is required by the intermittency of renewable energy sources due to variability in wind velocity and sunlight with weather, season, and time of day.

Various requirements are in place to assure that the substitution of non-renewable sources is relatively contemporaneous with the generation by the renewable source, and that the substitute electricity represents a purchase of new energy (it is "incremental" to the load-serving entity's existing energy supply)

- **Category 3** (Unbundled RECs). This category consists of unbundled compliance RECs from an RPS-eligible facility. This category is purchased to claim RPS-eligibility for electricity produced by non-renewable sources.

Under the RPS, the required percentage of renewable energy sold by load-serving entities increases over three compliance periods: 20% by 2013, 25% by 2016, and 33% by 2020.

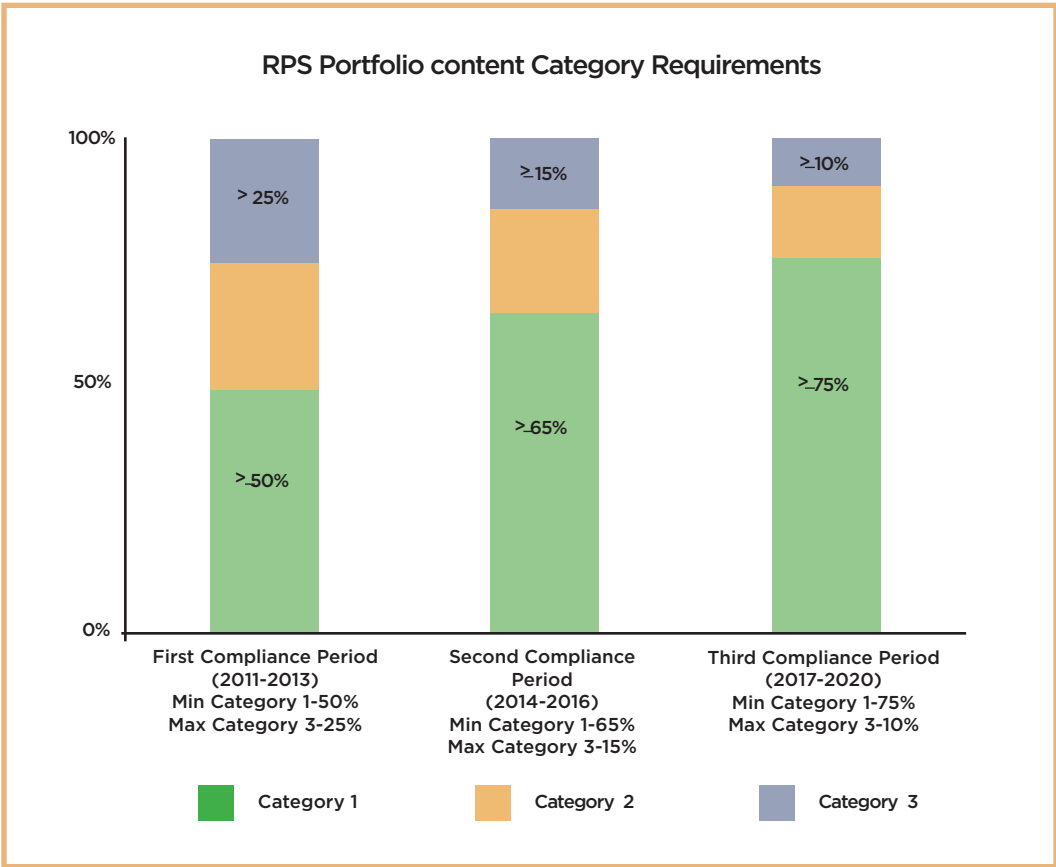
Within this requirement, the proportion of each category that can qualify as RPS-eligible renewable electricity changes over time as well, as shown in Figure 4.

**Table 1:**

**REC Portfolio Content Categories<sup>10</sup> (formerly termed “buckets”)**

Content Categories	Definition	Examples
<p>Category 1 procurement is: Procurement of Energy and RECs delivered to a California balancing authority (CBA) without substituting electricity from another source</p>	<ul style="list-style-type: none"> <li>• Energy and RECs from an RPS-eligible facility that is directly interconnected to the distribution or transmission grid within a California balancing authority area (CBA); or</li> <li>• Energy and RECs from an RPS-eligible facility that is not directly interconnected to a CBA without substituting electricity from another source; or</li> <li>• Energy and RECs dynamically transferred to a CBA.</li> </ul>	<ol style="list-style-type: none"> <li>1. Wind facility in Washington state delivers Energy and RECs with firm or non-firm transmission according to an hourly or sub-hourly schedule</li> <li>2. Biomass facility directly interconnected to CAISA delivers Energy and RECs</li> </ol>
<p>Category 2 procurement is: Procurement of Energy and RECs that cannot be delivered to a CBA without substituting electricity from another source</p>	<ul style="list-style-type: none"> <li>• Buyer simultaneously purchases Energy and RECs from an RPS-eligible facility, where the energy must not be already committed to another party, without selling the energy back to the generator;</li> <li>• Renewable generation is firmed and shaped with substitute electricity that is scheduled into a CBA within the same calendar year as the RPS generation; and</li> <li>• Substitute electricity provides incremental electricity to the buyer.</li> </ul>	<ol style="list-style-type: none"> <li>1. Buyer procure Energy and RECs from Wind facility in Oregon; renewable energy is firmed and shaped by third party; substitute electricity is delivered to buyer; RPS credit equals the volume of RECs generated by wind facility</li> </ol>
<p>Category 3 procurement is: Procurement of unbundled RECs only, or RECs that do not meet the conditions for Category 1 and 2</p>	<ul style="list-style-type: none"> <li>• Unbundled RECs originally associated with generation from an RPS-eligible facility (i.e., no Energy procured);</li> <li>• Unbundled RECs that do not qualify under the criteria of Category 1 and 2</li> </ul>	<ol style="list-style-type: none"> <li>1. Buyer procures unbundled RECs from RPS-eligible facility (could be from a wholesale generation facility or a customer-owned facility)</li> <li>2. A Category 2, firmed and shaped transaction, where some of the substitute electricity is not scheduled in the calendar year of the RPS-eligible generation</li> </ol>





**Figure 4:**  
**Content Categories to Meet RPS Requirements<sup>11</sup>**

This graph shows the percentage of different content categories allowed within an RPS-compliant renewable energy offering, over California's three successive compliance periods. Over time, the portion of Category 1 (bundled electricity) increases while the portion of Category 3 (unbundled RECs) decreases.

The requirement for Category 1 increases from a current minimum of 50% of the renewable electricity to greater than 75% by 2020, while Category 3 shrinks from a current maximum of 25% to 10% by 2020.\* The progressive shift toward Category 1 and 2 electricity for load-serving entities to meet RPS compliance is meant to drive the development of new renewable generation that will displace fossil fuels and provide direct environmental and economic benefits to California.

**Compliance REC Pricing**

While in theory the monetary value of compliance RECs should reflect the difference between the costs of producing renewable energy and the cost of electricity from conventional sources, this is not often the case. In practice, the price of RECs appears to depend principally on market conditions: regulatory policy, type of renewable facility, supply and demand, and so forth.† In the recent past, for example, the price of such RECs has varied greatly: in some states it has been about 25% of the price of the associated electrical energy, but in others it has been much lower.<sup>12</sup>

*California's RPS approach initially allows the use of unbundled RECs to fulfill RPS compliance requirements; but phasing such RECs out over time, in favor of actual new renewable energy sources, is an integral part of our state's long term approach.*

**Andrew McAllister,**  
**Commissioner,**  
**California Energy**  
**Commission**

\*These percentage requirements only apply to contracts executed after June 1, 2010. Contracts executed prior to that date are grandfathered. The portfolios of the investor-owned and publicly-owned utilities contain a substantial portion of contracts that are grandfathered.

† For bundled RECs, which are not sold separately, the price of a REC is taken to be the differential between the wholesale price of the associated electricity and non-renewable electricity. However, for unbundled RECs prices are determined by the market, as quoted on REC exchanges.

## Voluntary RECs

Many businesses and institutions would like to be able to claim that the electric power they are using comes from renewable sources even though their respective load-serving entities are providing them with electricity from a mix of sources, including fossil fueled power plants. Electricity consumers make this claim by purchasing unbundled RECs on what is called the voluntary REC market.

The desire to claim use of renewable energy by investing in remote development has accounted for the growth of the voluntary REC market over the last 20 years. The main certification program for voluntary RECs is operated by Green-e,<sup>13</sup> which certifies RECs with a wide range of attributes. Green-e standards of certification for voluntary RECs generally differ somewhat from standards for compliance RECs set by the different states (for example in geographical requirements, types of energy sources covered, allowable timeframe of REC generation, how quickly RECs must be retired, and so forth), sometimes being more stringent and sometimes less so.\*

Many voluntary RECs (and unbundled compliance RECs as well) correspond to renewable electricity from facilities financed without depending on revenue from the sale of unbundled RECs—the ability to finance the renewable generating facility being due to long-term electricity purchase commitments based on competitive generating costs, income tax credits, government subsidies, or rebates. In these cases, the REC revenue simply represents an added measure of profitability: sale of such RECs represents a source of income to renewable energy producers, but at a price that is generally too low or too volatile to significantly affect development of additional renewable generation capacity.

While there might be cases where the sale of unbundled RECs does play a decisive financing role, this cannot be determined simply from REC attributes. To be a factor in stimulating renewable generation capacity, voluntary RECs would need to be sold in a manner that provides predictable cash flow, for example through long-term REC purchase contracts (10 – 20 years).

### *Purchase and Sale of Voluntary RECs*

As explained above, the short-term purchase of RECs on the voluntary REC market, while generally making renewable generation more profitable, makes only a questionable contribution to increasing renewable energy generating capacity. So the claim that the purchaser is supporting new renewable energy development can be quite misleading.

Put another way, from a societal point of view, it doesn't really matter who owns an unbundled REC. The simple change of ownership from one party to another has no environmental or social impact. The purchase of these RECs might feel good and even look good to others, and it might even provide legal bragging rights for using renewable energy. However, unless the purchase transaction actually enables the development of new renewable generation that would not otherwise have occurred, there is scant legitimacy to the claim of displacing fossil fuels or reducing greenhouse gas emissions.†

Furthermore, the purchase of an unbundled REC normally denies electricity customers the fixed-price benefits of RECs that are bundled with renewable energy. This is because the price of the actual energy supply, which includes a mix of sources, including fossil fuel sources, often depends on the price of fossil fuel, which varies with supply and demand. By purchasing a REC and its corresponding energy bundled together in one long-term fixed-price transaction, the customer is protected against the volatility of fossil fuel prices (mostly natural gas).

\* A Green-e certified REC has to be generated within the current year, the last 6 months of the previous year, or the first 3 months of the next year to be eligible for a given year. The REC must come from a facility that was built no more than 14 years ago and is still operating today.

† Some argue that a growth in demand for voluntary RECs—a growth in the voluntary REC market—will drive up prices to where their purchase might result in new renewable generation. However, most voluntary REC purchases are short term and prices remain volatile, limiting this impact.

*The litmus test for unbundled RECs is whether they're stimulating development of new renewable-energy generation or whether they're just rearranging the deck chairs. Only long-term REC purchases can make a difference in helping renewable power projects build new facilities. Otherwise, whoever buys the RECs is simply paying for a project that would have been built anyway, or already has been built, simply fattening the bottom line of the project developers.*

**Mathew Freedman,  
Staff Attorney,  
The Utility Reform  
Network (TURN)**

In addition, the voluntary REC market is itself very volatile, representing supply and demand dynamics. At the low end, RECs are priced on the order of \$1, or about 50 times less than RPS compliance RECs in many states.<sup>14</sup> The least expensive voluntary RECs are generally generated from older vintage wind facilities and represent virtually no additional renewable capacity.



Figure 5:

*Bragging rights, yes.  
But supporting new  
renewable energy  
development?  
Probably not.*

## Utility Green Option Programs

A number of electric utility companies have proposed “Green Option” programs that offer 100% renewable energy to their customers.

For example, Pacific Gas & Electricity (PG&E), California’s largest investor-owned utility, has proposed a “Green Option” to allow its customers to pay a small premium for a claim that they would be using 100% renewable energy. That claim, as originally proposed by PG&E, would have been based on the purchase of inexpensive, Green-e certified voluntary RECs to increase the percentage of renewable energy to 100%. However, such RECs would not likely represent a significant contribution to the increased production of renewable energy.

In fact, PG&E’s original proposal would likely have inhibited the development of new renewable generating sources. For example, if ratepayers are led to believe that a small price premium will result in 100% renewable electricity, they will not support pursuit of other truly renewable energy developments such as the local energy efficiency and new generation planned for CleanPowerSF’s nascent Community Choice program. This is especially true for larger price-conscious businesses and other institutions that otherwise might make a substantial contribution to new local renewable energy generation.

A number of organizations opposed PG&E’s false marketing scheme, and have engaged in discussions that resulted in a settlement with PG&E that alters the original proposal in favor of including only bundled RECs in PG&E’s Green Option. This settlement proposal, buttressed by recent passage of a statewide “Green Option” bill (SB 43), is now pending before the California Public Utilities Commission.

## Meeting Community Choice Objectives

This paper has sought to demonstrate that the purchase of unbundled RECs, while permitted under RPS compliance standards, does not, in itself, imply the building of new renewable generation facilities.

Further, it has established that the purchase of unbundled RECs to exceed RPS requirements and claim up to 100% renewable energy, as PG&E has proposed to do, would not likely offset fossil-fuel use, while increasing the price of electricity and exposing customers to the volatility of fossil-fuel prices.

In light of these arguments, is there a role for unbundled RECs in the procurement strategy of a Community Choice energy program?

The answer to this question might be “yes” under some circumstances.

For example, for a Community Choice program to finance the local build-out of renewable generation and energy efficiency, a certain revenue-to-debt ratio for the financing must be maintained. A large customer base can be essential to generating sufficient revenue to maintain that ratio, and this customer base must be supplied initially with energy bought on the wholesale market. Capturing that customer base requires that the Community Choice offering be competitive with that of the incumbent utility.

In most cases, to be attractive to customers, the Community Choice program must offer a more renewable portfolio than the incumbent utility at a comparable price.\* Under current market conditions, the purchase of unbundled RECs can sometimes be essential to that competitive margin.

In short, the procurement of unbundled RECs might be justified if it makes it financially possible for the Community Choice program to invest in the development of new local renewable energy resources (both local renewables and demand reduction).

In such situations, the RECs are not playing an anti-competitive function with respect to the Community Choice program, or, by extension, to the development projects of the program. Instead, the purchase of these RECs might be what enables the program to accomplish its local clean energy goals.

In a way, this is what the state is doing to meet its RPS goals. Purchasing unbundled RECs is initially allowed for meeting RPS compliance as new generating facilities are being built, but these REC purchases are phased out as new renewable generating facilities come on line.

In other words, if properly used, unbundled RECs could provide a material basis for the development of new local renewable energy resources that would otherwise not be built.

However, it is important to note that to legitimately make this argument for a particular Community Choice program, two conditions should be fulfilled. The first is that the program has a concrete business plan and schedule for the development of local renewable energy resources, and it is implementing that plan.

The second is that the program does not make unsubstantiated claims that purchasing unbundled RECs increases the percentage of renewable energy in its portfolio. Making such claims, without full transparency regarding the actual RECs being purchased, can undermine the credibility of the Community Choice program.

After all, the purpose of Community Choice energy is not to claim renewable energy, but to build it.

## Conclusion: High Stakes

The transition from fossil-fuel energy sources to renewable energy sources is a social, environmental, and economic imperative. Schemes which give the appearance of replacing fossil-fuel electricity with renewable electricity, but which don't accomplish that end, actually retard that transition. The use of low quality, voluntary RECs simply to claim new renewable electricity generation is one such false scheme.

At a minimum, the claim of new renewable energy development, while continuing to purchase fossil-fuel electrical power, must be supported by bonafide new renewable energy development. For Community Choice energy programs, in particular, the surest road to renewable energy is the development of local renewable energy resources.

\* Note that this challenge does not imply offerings of “dark green” portfolios (a large percentage of renewable energy) based on purchase of unbundled RECs. In fact, the portfolio should be structured to minimize the use of unbundled RECs.

*A Community Choice energy program that prioritizes the building of local renewable energy assets can be a great opportunity and tool for creating pathways and incentives for economic development in low-income communities of color. It can create new jobs and businesses, as well as rules for local hiring and procurement.*

**Miya Yoshitani,**  
**Associate Director,**  
**Asian Pacific**  
**Environmental**  
**Network (APEN)**

# Addendum

From Al Weinrub

In response to the first edition of this paper, readers have asked about the similarities between RECs (certification of renewable energy) and carbon offsets (certification of greenhouse gas reduction).

Both allow businesses, especially big energy companies, to continue destructive environmental practices by purchasing dispensations to do so. In the case of unbundled RECs, it means that utilities can deliver fossil-fuel generated electricity and call it renewable. In the case of carbon offsets, it means that electric generating stations, and other carbon-intensive businesses, can continue to burn fossil fuels despite caps on carbon emissions.

In both cases, purchase of these allowances is asserted to have environmental value, that is, to result in an environmental benefit that would not otherwise have occurred – what is called additionality. However, in both cases it is difficult, if not impossible, to verify additionality. In fact, on the international level, the use of carbon offsets has been plagued by scandal and fraud.

Both (unbundled) RECs and carbon offsets represent a growing trend in global market expansion, namely creating a market for qualities that are derived, but separate, from the real thing: renewableness separate from the energy, offsets separate from the sequestered carbon. Like Wall Street derivatives, they represent an ideological commitment to global market expansion and increased accumulation of capital, not to addressing social, economic, and environmental challenges.

## References

- 1 <http://www.energy.ca.gov/2012publications/CEC-300-2012-006/CEC-300-2012-006-ED6-SD.pdf>
- 2 <http://www.caiso.com/about/Pages/OurBusiness/UnderstandingtheISO/The-ISO-grid.aspx>
- 3 <http://www.earthlyissues.com/uspower.htm>
- 4 *Decision on Definition and Attributes of Renewable Energy Credits for Compliance with the California Renewables Portfolio Standard* (CPUC 8/22/2008 [http://docs.cpuc.ca.gov/word\\_pdf/FINAL\\_DECISION/86954.pdf](http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/86954.pdf)) Page 16 and following of this document provide detailed information in support of the basic information below.  
See also: <http://www.cpuc.ca.gov/PUC/energy/Renewables/FAQs/05REcertificates.htm>  
According to SB 107:  
(1) 'Renewable energy credit' means a certificate of proof, issued through the accounting system established by the Energy Commission pursuant to Section 399.13, that one unit of electricity was generated and delivered by an eligible renewable energy resource.  
(2) 'Renewable energy credit' includes all renewable and environmental attributes associated with the production of electricity from the eligible renewable energy resource, except for an emissions reduction credit issued pursuant to Section 40709 of the Health and Safety Code and any credits or payments associated with the reduction of solid waste and treatment benefits created by the utilization of biomass or biogas fuels.  
(3) No electricity generated by an eligible renewable energy resource attributable to the use of nonrenewable fuels, beyond a de minimus quantity, as determined by the Energy Commission, shall result in the creation of a renewable energy credit.
- 5 Full information about state programs can be found at <http://www.dsireusa.org/rpsdata/index.cfm>
- 6 Same as Note 4.
- 7 <http://www.wecc.biz/WREGIS/pages/default.aspx>
- 8 [http://docs.cpuc.ca.gov/WORD\\_PDF/FINAL\\_DECISION/154695.PDF](http://docs.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/154695.PDF)
- 9 [http://docs.cpuc.ca.gov/WORD\\_PDF/FINAL\\_DECISION/156060.PDF](http://docs.cpuc.ca.gov/WORD_PDF/FINAL_DECISION/156060.PDF)
- 10 <http://cpuc.ca.gov/PUC/energy/Renewables/hot/33RPSProcurementRules.htm>
- 11 Same as Note 10.
- 12 <http://apps3.eere.energy.gov/greenpower/markets/certificates.shtml?page=5>
- 13 <http://www.green-e.org/>
- 14 Same as Note 12.