



Update: Overcoming the Corporate Green Power Trap

November 2017 Commentary:

*Co-authored by JD Capuano while running the consultancy Closed Loop Advisors in 2014, **Overcoming the Corporate Green Power Trap** contains advice that has been validated over the past several years. The team at **Third Partners** sustainability consultants is giving the paper a permanent home on the web with the goal of making it easier for organizations of all sizes to make the switch to renewable energy in a meaningful way. In this commentary we highlight what has changed and what has stayed the same since the paper's original release.*

What has changed:

The GHG Protocol released new guidance on scope 2 emissions at the beginning of 2015, allowing companies to report location- and market-based emissions. This paper aimed to deemphasize the use of unbundled RECs because of clear evidence that these products fail to create additional bona fide renewable energy generation; however, new guidance from the GHG Protocol opened the floodgates for organizations to use these ineffective products for emissions reduction.

In spite of guidance legitimizing unbundled RECs, many companies have selected, and continue to leverage other, more impactful market mechanisms to reduce scope 2 emissions.

Physical power purchasing agreements (PPAs) and virtual PPAs (VPPAs) have gained in popularity in US states with a wholesale electricity market. Physical PPAs, are contracts for power delivered to the offtaker with bundled RECs. Virtual PPAs (VPPAs), are financial contracts where the offtaker agrees to purchase a project's energy output and associated RECs at a set price. The developer liquidates the energy at market pricing and the offtaker either receives revenue or incurs the cost of the price difference between its PPA rate and the market price.

Both types of PPAs are established in Europe and are either established or gaining traction in Asia and Oceania, Africa and South America.

We advise organizations to evaluate the merits of PPA and VPPA deals. These renewable energy purchasing structures can make economic and environmental sense depending on a variety of factors. It is crucial to look closely at the details, especially the risks. PPAs are likely to be the right fit if senior leadership buys-in to the competitive advantages of PPAs over other green power options, which include: additionality, power price hedging, and supporting the company's sustainability strategy rather than purely generating financial gains.

In addition to PPAs, green power products have gained traction among corporate electricity buyers. Green power products are bundled electricity and RECs available from third parties in US states with deregulated electricity markets, and in other countries, including the UK.

Green tariffs are an alternative option in some US states with regulated electric utilities. They consist of a special electricity rate offered by traditionally regulated utilities, allowing eligible customers to source up to 100% of their electricity from renewable sources (customers buy both the power and the RECs). Green tariffs emerged in response to corporate pressure for access to clean electricity. As of early 2017 there were 8 projects in 6 states.

What has not changed:

We mostly agree with the original guide that unbundled RECs should be used as a last resort. They send the weakest market signal of all the options listed above, especially if they are the cheapest coming from states with no or small renewable portfolio standards (TX, IA, OK). Many organizations pursuing green power operate out of dense urban areas and can install very little renewable power on-site in the best of circumstances. We recommend RECs in certain situations, mainly as an interim reduction step for a company pursuing a PPA, or where green power products and green tariffs aren't available.

We wholeheartedly agree with this paper's advice to first focus on energy efficiency and on-site renewables, where possible.

Additional Tools:

More companies are setting an internal price on carbon to prioritize emissions reduction projects. We believe internal carbon pricing is a smart move for some companies because it increases awareness and alignment, can make energy reduction projects look more financially attractive, and can be a source of funds for efficiency or clean power investments. We are actively helping leaders design the best way to set up carbon pricing.

Lastly, "green bonds" are gaining traction, and not just with financial institutions. Apple was vociferously lauded for a massive green bond the company issued in February 2016.

Closing Thoughts:

Given the eminent threat of climate change, purchasing renewable power and reducing emissions both on-site and through market-based mechanisms is a journey for every company to take. We hope this guide makes that journey a little easier.

Please contact us if we can help leaders in your organization apply the information in this guide to help accelerate your path to emissions reduction.

Sincerely,

The team at Third Partners

Adam Freedgood

John Haugen

JD Capuano

**OVERCOMING
THE CORPORATE
GREEN
POWER TRAP**



EXECUTIVE SUMMARY

The vast majority of companies in the United States don't bother to buy renewable energy; most of those that do, whether they know it or not, are achieving minimal real world benefits with their purchase. This paper can help corporate decision-makers optimize their procurement of renewable energy to add renewable capacity and displace fossil fuels, leading to real emissions reductions and other benefits.

Burning fossil fuels for electricity is the primary U.S. contribution to climate change

The latest IPCC report was clear; “anthropogenic emissions of greenhouse gases are the highest in history”, warming of the earth is “unequivocal”, and changes in the climate are already having “widespread impacts on human and natural systems.”¹

Electricity production is responsible for the largest share of greenhouse gas emissions in the United States; 32% in 2012. Over 70% of our electricity comes from burning fossil fuels; and 39% from coal.² Only around 6% comes from wind and solar.

A large-scale shift to renewable energy is an integral part of reducing our carbon footprint and avoiding even worse impacts from climate change.

In the absence of action in the U.S. Congress, customers are looking to companies to take action, and many companies are responding.

In the United States, 60% of the Fortune 100 companies have set goals to reduce greenhouse gas emissions, and 14% have set specific goals for renewable energy use as part of this effort to combat climate change.³ The EPA's Green Power Partnership includes over 1,300 organizations, companies, universities, and municipalities that have committed to buying renewable energy for some portion of their energy use.⁴ According to the Global Consumer Wind Study 2012, which surveyed 24,000 consumers across 20 countries, 74 percent of the respondents believe “companies can positively affect how consumers perceive their brand by switching to wind energy.”⁵

Although the primary reason consumers care about companies using renewable energy is because of concerns about climate change, there are two distinct kinds of benefits organizations may experience:

1. MARKETING BENEFITS

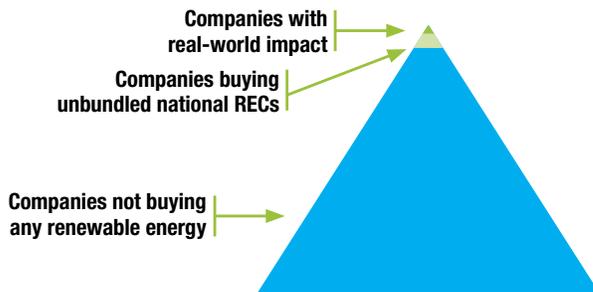
The legal ability to state:
“we are powered by
zero-emission,
renewable energy”

2. REAL WORLD BENEFITS

Mitigating climate change:
new renewable capacity,
displacement of coal,
reductions of global warming
emissions

Business rationale:
reduced costs
and price volatility,
diversification

▶ Most U.S. companies believe their renewable energy purchase is providing real world benefits, but the vast majority are only getting marketing benefits.



Why? Because the most popular, cheapest and easiest option for buying renewable energy – representing over 80% of non-residential U.S. renewable energy procurement – is to simply purchase the marketing rights to existing renewable energy, in the form of unbundled Renewable Energy Certificates, or RECs. But shifting the marketing rights from one party to another does not change anything in the real, physical world.

The companies buying these marketing rights are legally permitted to claim they have reduced their emissions, but companies which have not purchased marketing rights must now report higher emissions to compensate for the renewables which they can no longer claim as part of the energy mix on their local grid. Greenhouse gas emissions are unchanged, and the amount of renewable electricity in the mix is unchanged. In other words, RECs are not “additional” – everyone agrees they do NOT represent a net reduction in greenhouse gas emissions.

▶ We don’t think this is really what most companies buying renewable energy intend to do with their purchase.

As companies buying renewable energy grow more sophisticated, they are demanding better options and new procurement options are emerging. Google, Sprint, Walmart, and others are seeking to maximize the real-world impact of their renewable energy purchasing and investments.

As this movement strengthens, we think that even companies that prioritize the marketing benefits and think of the real world benefits as secondary will begin to see the reputational risks in continuing on the current path. We believe that companies will increasingly be evaluated on the effectiveness of their climate change mitigation strategies, not just on their marketing claims. To help companies maximize their impacts, we developed an analytics-based Renewable Procurement Hierarchy to guide renewable energy decision-making.

Read on to learn more about how we got here, and how to ensure your company’s purchase of renewable energy has an impact in the real world.

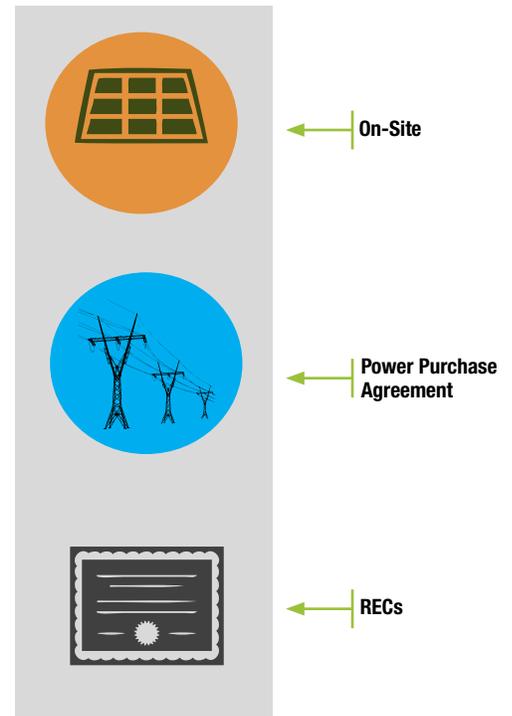
BACK STORY

Renewable Energy Options

Buying “renewable energy” conjures up visions of electrons streaming from solar panels and windmills directly to offices, factories and datacenters. This is the dream – the simple ideal for companies that want to clean up their environmental footprint. But it’s seldom so simple.

Onsite renewables are often an option only for companies that own the buildings they occupy and have a well-suited site for solar or wind.

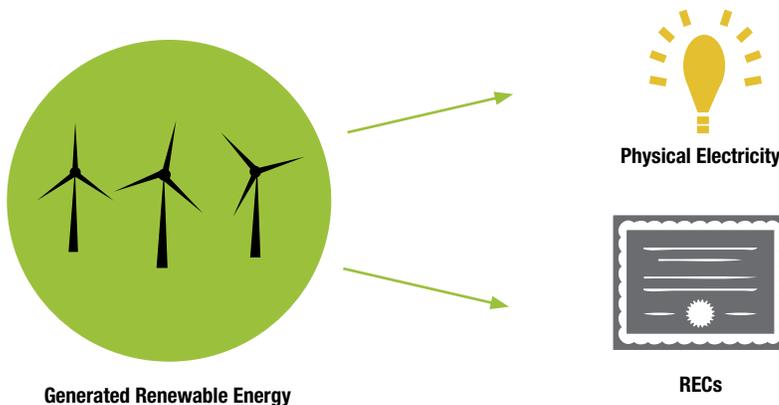
Businesses in the US do have other options when they are thinking about buying renewables: they can contract directly with a local renewable generator if they have sufficient scale and are in a state where this is permitted, or they can purchase green energy from an energy service company (ESCO) or their utility. However, ESCOs are active only in deregulated state energy markets, and often neither the utility nor local ESCOs offer green options. The remaining option, which is open to every company, is to buy Renewable Energy Certificates (RECs). Even where green options are offered by utilities or ESCOs, instead of developing their own renewables or setting up a power purchase agreement, these actors often choose to supply these options with RECs.



What are Renewable Energy Certificates?

Renewable Energy Certificates are a tracking mechanism for renewable generation, which is necessitated by the way electricity works. Once electricity is generated and placed on the grid, the electrons generated by a wind turbine are indistinguishable from those generated by a coal-fired power plant.

A helpful analogy here is dolphin-safe tuna. The tuna is the same as any other tuna, but the way it was captured, and the responsibility of the process, is different and matters to conscientious tuna buyers. Just as a certification system exists for responsibly caught tuna, so does a system to track renewable generation. The non-profit Green-e performs this function in the United States for the voluntary market, certifying that RECs represent renewable energy that has been placed on the grid and has not been double-counted.





A sustainably caught tuna can be followed through a chain of custody from fisherman to consumer – but electrons cannot be followed through the grid. Thus the REC travels separately from the electrons. Using the tuna analogy, it would be as if the sustainably harvested tuna were mixed with tuna caught by other means in a boat, and the dolphin-safe certificate was then paired with any of the fish sold upon arrival at the dock. RECs and electricity sold in a single transaction in this way are called “bundled,” but the REC can be sold on its own without electricity which is called “unbundled.”

Continuing with the tuna analogy, a “bundled” tuna purchase would entail a purchase from a sustainable fisherman of both a fish from the mixed pile on the boat and a dolphin-safe certificate. Just like electrons from the grid, the specific tuna received from the mixed pile may or may not be a certified one. An “unbundled” purchase would be just the dolphin-safe certificate, to be paired with a tuna sourced from a completely different boat. The idea of unbundled RECs adds complexity and brings with it some opportunities and some challenges.

Unbundled national RECs have enabled every company to buy renewable energy

In 2004, it was difficult for most companies to buy renewable energy. Now it is cheap, easy, and universally available. What has changed? There are still not many utilities offering customers a “green pricing” option. There are still few states that allow competitive energy service companies or ESCOs to make green energy options available to customers (only 16 “deregulated” states have active ESCOs). What made purchasing renewable energy cheap, easy, and available to every company was the introduction of unbundled national RECs to the “voluntary” market. While it is possible to buy RECs regionally, in-state, locally, or even from a specific wind farm, most companies choose to buy “national RECs” which in practice means “from wherever in the U.S. they are cheapest.” NREL estimates 66% of voluntary renewable electricity purchases overall, and 76% of all purchases made by partners in the EPA Green Power Partnership, are from unbundled RECs.⁶ The majority of these are national RECs.

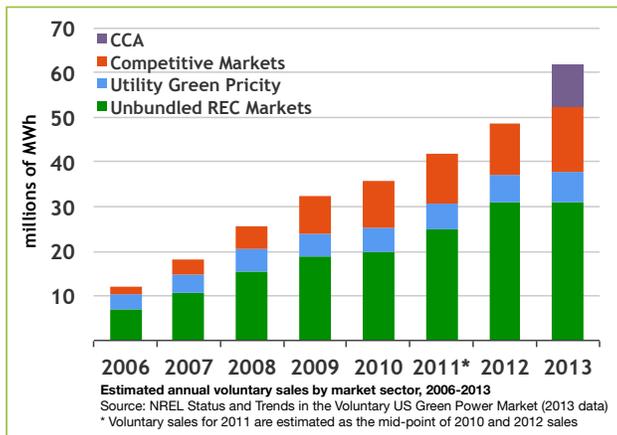


Sales of unbundled national RECs have skyrocketed over the past decade.

The option of buying RECs unbundled (separately from the electricity they are associated with) allows unlimited flexibility because there is no physical delivery of electricity to worry about. Is your company in a state that is not deregulated, or does it lease instead of own office space? No problem. Unbundled national RECs have enabled any organization willing to pay a premium to channel some revenue to a generator of renewable energy. Sales of unbundled national RECs have skyrocketed over the past decade as more organizations and institutions have gotten involved. And in fact, most ESCOs, and some utilities offering green energy options use unbundled national RECs in their products.

RECs were designed for the compliance market

The idea of separating the “green attributes” from the physical electricity originated in the 1990s as a way to allow utility companies to more efficiently meet state mandated levels of renewable electricity generation by buying certificates from other utilities or generators with better siting, expertise, or finances to develop renewables. These state “Renewable Portfolio Standards” created compliance markets for RECs, where utilities who didn’t build sufficient renewable capacity to



UNBUNDLED RECS LIKELY REPRESENT AROUND 90% OF THE NON-RESIDENTIAL VOLUNTARY MARKET

- 81% are unbundled RECs (the green bar) purchased separately from electricity
- The remainder, green power offerings from ESCOs (the red bar) and utilities (the blue bar), is often supplied using unbundled RECs as well

comply with the standard purchased enough RECs to comply with the minimum legal requirement for renewable generation.

As of November 2014, 29 states, plus Washington D.C. and 2 offshore territories have renewable portfolio standards.⁷ Nearly all the state RPS policies require RECs to be sourced from within that state or region. These geographical restrictions were instituted to ensure local development of renewable energy, for a host of reasons: reduced air pollution, energy security and independence, increased employment, etc. Because compliance RECs nearly always must be sourced in-state or regionally, the seller and buyer are usually on the same regional grid. The RECs function as a proxy for renewably-generated electrons, some of which could theoretically reach the buyer.

The voluntary market for RECs is unregulated

When companies buy RECs, they do so not in the compliance market, but in the voluntary market. Because they are not required to buy the RECs, no government agency regulates their sale or purchase geographically or otherwise. Because there is no carbon tax in the United States, no government agency regulates the claims that can be made with the RECs. The most likely agency to regulate these instruments, the Federal Energy Regulatory Commission (FERC) has officially ruled that “unbundled REC transactions fall outside of the Commission’s jurisdiction.”⁸

How do RECs differ from carbon offsets?

RECs are specific to electricity. They are denominated in megawatt hours, whereas carbon offsets are denominated in tons of carbon emissions. RECs and carbon offsets are both certified as to their source and the fact that they have not been double counted. A certified carbon offset also must be “additional.” This means that the carbon it represents would not have been sequestered or avoided if the carbon offset had not been purchased. This “additionality” means that the purchase of the offset has resulted in a net reduction in carbon. A REC comes with no such guarantee. However, RECs do allow a company to report lower carbon emissions associated with its electricity use. How is this possible if there hasn’t been a net reduction? It’s because someone else, wherever the REC originated, is now supposed to use a slightly higher carbon emissions factor (CO₂ per kilowatt hour) when they report their emissions (if they are reporting their emissions). This is called a “residual grid mix.” Reporting on this “residual mix” requires virtually removing some wind or solar power from the physical grid mix actually received. Going back to the tuna analogy, it’s as if person A ate a certified dolphin-safe tuna, but person B purchased the rights to claim that he ate it. Person A now may not legally claim that he ate it. If he wants to make claims about his tuna consumption, he must reference his “residual mix,” an unsustainable tuna.

THE PROBLEM WITH UNBUNDLED NATIONAL RECS

No additionality means no real world impacts in the near term

Green Mountain Energy, the largest “green” ESCO (energy service company) in the United States, calculated that in 2013 its customers avoided 6 billion pounds of CO₂.⁹ It appears the vast majority are from unbundled RECs. The calculation compares the average per capita US grid emissions to customer emissions, based on the “percentage of customers’ electricity that comes from new renewable resources.”

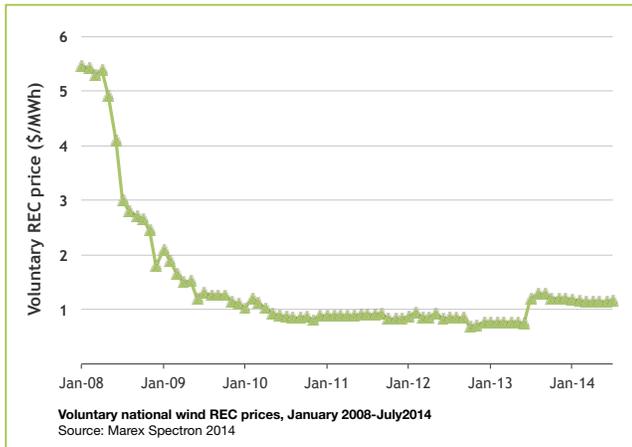
We view this as true in a narrowly defined way, given that their customers have purchased the legal rights to the green attributes of that electricity. Someone else, in the place where those RECs were generated and sold, is now meant to take responsibility for those 6 billion pounds of CO₂. Those emissions didn’t disappear and they were not avoided when you look at the country as a whole. Shifting ownership of a claim from one party to another does not avoid GHG emissions. And this means that from a climate change point of view, the REC purchase has not improved the situation.

National REC prices are too low to spur new development

RECs are not additional and therefore do not reduce net carbon emissions when purchased. But they do have the potential to spur additional investment in renewable energy in the future by subsidizing renewable energy project developers and providing a market signal that new investments will be rewarded. However, the strength of this signal in spurring construction of new renewable capacity is very dependent on price. A \$20 REC represents a subsidy of 2 cents per kilowatt-hour (kWh). Given that wholesale energy prices in the U.S. are usually around 3-5 cents/kWh, this is a significant subsidy. A \$1 REC, on the other hand, represents a tenth of a cent/kWh.

▶ A \$20 REC can legitimately spur investment in new renewable capacity. A \$1 REC will not.

In some states, 1-2% of a renewable generator’s revenue is coming from the sale of RECs – which means the RECs provide very little incentive for that owner or other potential market entrants to expand.¹⁰ A recent [Bloomberg article](#) quoted Duncan Broatch of Summit Hydropower on his income from selling RECs; “I get a check in the mail; it’s barely worth the paper it’s written on.” If a developer of renewable energy in one of these states decides to expand, it’s not credible to attribute this decision to the income from selling RECs. In fact, renewable developers in states like Texas often exclude the expected revenue stream from REC sales from the forecasted project cash flows, because it is so inconsequential. One dollar – or a bit less – seems to be the support price where RECs don’t get any cheaper because the revenue wouldn’t cover the transaction costs. In Texas, for example, some renewable generators aren’t even bothering to register in the REC program.¹¹



**National
Voluntary
REC prices
have hovered
around a dollar
for the last
five years¹²**

Surplus RECs from Compliance Markets are suppressing REC prices

RECs tend to be cheapest where the wind blows the strongest. The three top states supplying RECs to the voluntary market in 2012; Oklahoma, Texas, and Iowa, have consistently high wind speeds and thus some of the lowest costs in the nation for wind power. Some would argue this demonstrates the national REC market is working well; revenue from REC purchasers all over the country is being directed to the areas with the strongest renewable resources; even if REC prices are low, the revenue is helping renewable project developers.

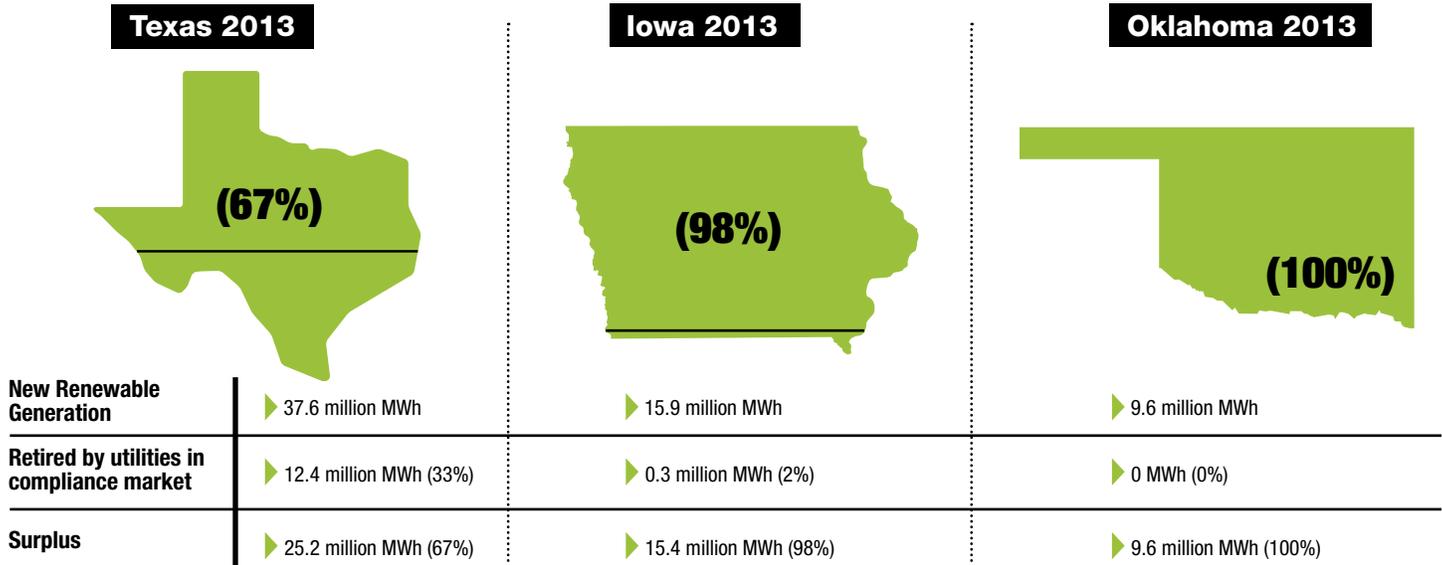
But the reason RECs are cheapest in Texas, Oklahoma, and Iowa is not just the wind speeds. These unbundled national RECs are effectively a waste product from state renewable portfolio standard (RPS) compliance markets. These states have an oversupply compared to what is required for utilities buying RECs in their compliance markets. Oklahoma has no compliance market, so its entire production is available for the voluntary market. Iowa's installed capacity is 50X what its utilities need for compliance, and Texas has the most installed wind capacity in the nation – enough oversupply to meet the needs of half the voluntary market alone.¹³

Evidence suggests that revenue from the sale of RECs is not needed to spur development in these markets – the renewables there would have been constructed in the absence of RECs, because of the local economics. A recent [New York Times article](#) points out that renewable energy – especially in Texas and Oklahoma – is now winning on price vs. conventional fuels. Where some see an effective national market channeling revenue to help develop the nation's strongest renewable resources, another point of view is to see the purchase of unbundled national RECs from these states as essentially taking advantage of the fact that each of these states has a giant pool of surplus RECs that cost close to nothing.

RECs left unpurchased in the compliance market had no value until some companies began to buy them to “green” their energy use around ten years ago. Oklahoma, Iowa, and Texas can now produce over 45 million surplus RECs annually – that is, RECs not required for the compliance markets in those states. Green-e certified sales

of renewable energy covered ~42 million in 2012.¹⁴ This means roughly the entire voluntary REC market can be supplied by the overflow from these three states.

ESTIMATED COMPLIANCE MARKET SURPLUSES



Companies need not request RECs from oversupplied markets to receive them; if no origin is specified, REC marketers and ESCOs typically default to these markets. For ESCOs, margins are highest on these RECs, so often requests for local REC pricing will be rebuffed with a warning that the prices will be 10X higher, or more.

One argument that is made is that supply and demand will eventually come into alignment – especially as various state Renewable Portfolio Standards increase over the coming years. But voluntary purchases will not cause unbundled national REC prices to rise until the voluntary markets can absorb the surpluses in all states. As shown above, these are very large surpluses. The voluntary market has not made much of a dent in them in the past 5 years, and we see no reason to believe they will be eliminated anytime soon.

Are local RECs better?

From a climate change point of view, a megawatt of renewable capacity in one place is the same as a megawatt in another place – it's a global challenge. There are some local benefits where renewables are sited that purchasers of renewable energy should keep in mind: reduced air pollution, energy security and independence, resilience in natural disasters, and increased employment are just a few.

But from a climate change perspective, the primary reason to buy local RECs (in markets that are not oversupplied) is that your purchase has an effect. You are sending a strong market signal to renewable developers that your state or region has demand for more renewable energy. REC purchases in markets that are not oversupplied are more expensive, and can represent a significant portion of the income for the owner of the renewable generation facility.

IMPACTFUL ALTERNATIVES

Some major companies are moving away from RECs

If a renewable energy purchasing option has no impact on overall emissions now, and doesn't effectively incentivize new renewable development for a lower-carbon mix in the future, what is the point of spending even small amounts of money on it? Here is what two major corporations think:



We want to do more than just shift around ownership

(and marketing rights) of existing renewable energy

we prefer not to simply offset our non-renewable power by purchasing standalone renewable energy credits (RECs) or other certificates. While REC purchasing may allow us to more quickly say we are supplied by 100% renewable energy, it provides less certainty about the change we're making in the world.”¹⁵ **(Walmart 2013)**

Google seeks to accomplish two important goals with renewable energy purchases:



Our purchases should be additional. This means they **should actually help to create more renewable power.**

Our investments should have the highest possible positive impact on the industry that they can.”¹⁶ **(Google 2013)**

Several major corporations have signed WRI's Corporate Renewable Energy Buyers' Principles, asking for more choice in procurement options, including “access to new projects to reduce emissions beyond business as usual.”¹⁷

A better role for unbundled national RECs, according to a recent CERES report, is as “a bridge while companies learn about other renewable energy investment strategies.”¹⁸ RECs also “offer the opportunity for a company to scale to its organization's total energy consumption, which can be difficult to do exclusively with PPAs and on-site direct investment.”

What other options exist and what impact do they have?

There are several alternatives we like, including some that have recently emerged:

- Corporate power purchase agreements (PPAs) and collective long-term contracts
- Community solar
- Utility green power rates tied to new facilities

Larger companies like Sprint have signed multiple PPAs over the past several years purchasing part of the output from new solar or wind farms, meeting their renewable energy targets and gaining protection from expected price increases and volatility.¹⁹ Some organizations (e.g., Walmart, Google, Facebook, University of California) will sign a PPA for the entire output of a new solar or wind farm. Other



organizations, typically those with less purchasing power, collectively negotiate a PPA to achieve economies of scale.

A concept that has been gaining traction lately is community solar. Such programs are developed by utilities and third parties to allow customers to purchase a share of a renewable system developed in the local community. So how does it work? A company can purchase several panels in a solar array and own the output of those panels. They sell the output to the utility, the utility feeds that energy to the grid, and directly credits that company's electric bill for the power produced. In many cases this can result in cost savings.

Choosing the two previous options, PPAs and community solar, can save money, protect against price volatility, and has a direct impact in creating new renewable capacity. However, in most cases, the RECs are retained by the utility or project developer. This means that the renewable energy cannot be counted in emissions inventories, toward corporate targets, for sustainability reports, or for EPA's Green Power Partnership. Part of the reason these projects save money is that the RECs are sold in the compliance markets to improve the economics of the projects. This is the one instance in which we believe it makes sense to purchase unbundled national RECs – to be able to count the equivalent amount of the PPA's renewable energy towards emissions inventories.

Another emerging option, utility green power options, such as one proposed by Duke Energy, will offer a voluntary tariff that will pass the cost of developing new renewable power within Duke's service area to the consumers who want it. We view this type of arrangement as an improvement on a typical utility green option, often based on a REC purchase by the utility, and should still convey the marketing claims to the purchaser.

For additional detail on these options and more, including case studies, we recommend reading this [NREL report](#).²⁰

Seek to maximize new renewable capacity with your purchase

Most cost-benefit analyses of different green power options focus almost exclusively on the cost side of the equation, assuming the benefits of all options are equal. However, the benefits of some options are far higher than others. We have developed a hierarchy to help companies choose the most impactful renewable energy procurement options.

Before we get to the hierarchy, it's important to explain what's behind it. Impact is measured in terms of contribution to new renewable capacity being added to the grid. New capacity is the best proxy for displacement of fossil fuels and therefore the mitigation of climate change through reduction in greenhouse gas emissions.



We believe the mitigation of climate change through displacement of fossil fuels is the primary reason most companies are buying renewable energy; it is the foundation of the marketing claims.

The green power options at the top of our hierarchy also offer additional benefits, including cost savings, price stability, and resilience.

Our hierarchy is based on a metric we developed to quantify the contribution a purchase makes to renewable capacity. Results of our Renewable Capacity Contribution metric (or RCC) are illustrated in the graphic below.

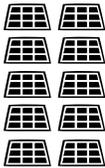
RENEWABLE CAPACITY CONTRIBUTION WATTS OF NEW CAPACITY PER MWH OF ELECTRICITY PURCHASED*

National RECs



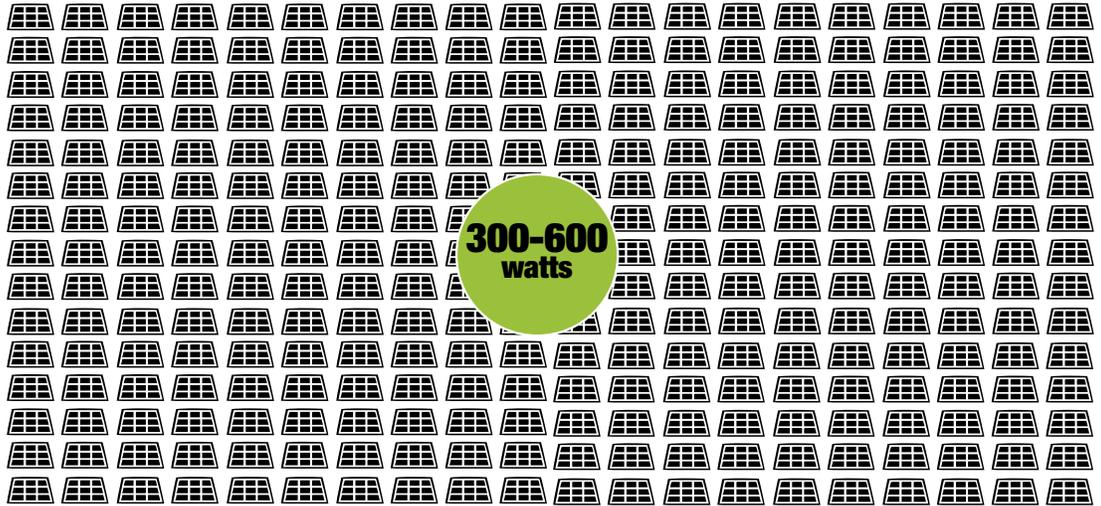
**1-2
watts**

Local RECs



**10-12
watts**

On-Site or Power Purchase Agreements



**300-600
watts**

* This graphic depicts one year's contribution to renewable capacity. On-site installations and PPAs provide electricity for many years without creating new capacity each year, whereas RECs must be purchased every year. Over 20 years national REC purchases would generate 20-40 watts of total capacity and local RECs would generate 200-240 watts, compared to the same 300-600 watts for the direct options. Thus, even over the longer time period, both REC options will create less capacity at higher cost than the on-site or PPA options. See appendix for additional details on RCC calculations.

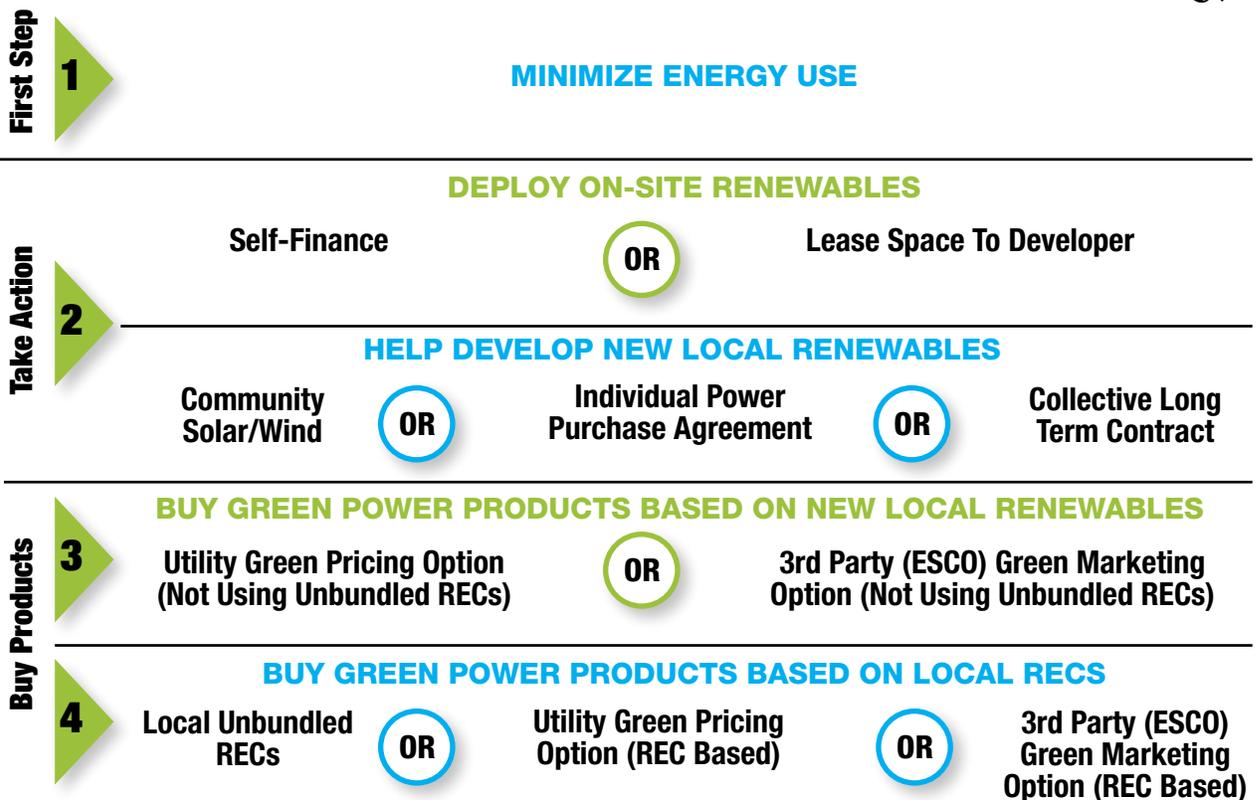


The RCC shows that direct investments in onsite or community solar, or the signing of long-term power purchase agreements enabling projects to be built, are far superior to purchasing RECs, from a new capacity point of view.

As you can see, unbundled national RECs contribute very little to new capacity. This is based on their extremely low price, and the weak market signal they send. Despite the low price of unbundled national RECs, direct investments and PPAs can be more cost effective, although they are not as easy to implement, and are not available to every company in every location.

Our hierarchy uses the RCC metric to rank the primary renewable energy procurement options by contribution to new capacity. Companies should try to meet their needs as close to the top of the hierarchy as possible. If a company does not own a particular space for which it is looking to procure renewable energy, the hierarchy should be viewed as a ranking of options for the landlord or management company to pursue.

RENEWABLE PROCUREMENT HIERARCHY



Depending on a company's scale, community solar or a PPA may make more sense than an on-site installation. A company renting space without a separate utility meter should seek to influence the landlord, potentially in coordination with other tenants, to explore these renewable procurement options for the building, passing upfront or incremental costs along to the tenants. Another possibility in states with utility or ESCO green energy options is to negotiate with the landlord to install submeters that enable tenants to choose renewable energy in their spaces.

Factors such as a company's scale, utility, property ownership, or location in a state where deregulation is not in effect or where corporate PPAs are not permitted, may result in unbundled RECs still being the only option. If this is the case, our recommendation is to buy "forward RECs" - a longer-term agreement to take delivery of the RECs from a new project for years into the future. These forward RECs can help improve the economics of the project enough to get it off the ground.

CONCLUSION

The actions companies take to address climate change, such as purchasing renewable energy, are a reflection of their values.

Making tough decisions that truly expand new renewable generation capacity, potentially at a higher upfront cost than other superficially comparable alternatives, is a demonstration of integrity. In this age of transparency and accountability, such decisions also enhance your organization's sustainability story. Purchasing unbundled national RECs to make green power claims may be cheap and easy – but runs a reputational risk if others, especially stakeholders, view it as greenwashing.

For companies that are already buying green power and those considering it, we hope our insights are helpful for taking a harder look at such decisions and their real world impacts.

Because of the range and complexity of renewable options, **Closed Loop Advisors recommends companies ask many questions about any RECs, or green options from ESCOs or utilities they are considering.** Careful consideration of the options coupled with frank discussions of both the cost and benefit sides of the investment equation can lead companies towards more impactful and meaningful decisions.

We realize this can get complicated, so please [reach out to us](#) if we can help.

ABOUT CLA



Closed Loop Advisors is a specialized management consultancy that focuses on integrating sustainability and business. Our work is a quest to help organizations become cleaner, leaner and more adaptive. To us, advisory stretches beyond cost savings, risk mitigation and brand enhancement to inspire our clients to innovate and protect the planet.

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ENDNOTES

- ¹ Intergovernmental Panel on Climate Change, [Synthesis Report](#) 2014
- ² Environmental Protection Agency, [Sources of Greenhouse Gas Emissions](#), 2012
- ³ [Why the World's Largest Companies Are Investing in Renewable Energy](#), CERES,
- ⁴ [EPA Green Power Partnership](#), Nov. 2014
- ⁵ Environmental Leader, 2012, [Consumers more willing to buy from brands using renewable energy](#)
- ⁶ [Status and Trends in the Voluntary US Green Power Market](#), NREL Oct. 2013
- ⁷ [Renewable Portfolio Standard Policies](#), Database of State Incentives for Renewables & Efficiency, Sept. 2014
- ⁸ [FERC](#), 2012 –page 7
- ⁹ [Green Mountain by the Numbers](#), Retrieved from Green Mountain Energy website, Nov. 30, 2014
- ¹⁰ Sample income components for a Texas renewable producer in 2014; wholesale electricity prices (Jan – Oct.) averaged \$43/MWH, the wind production tax credit (PTC) provided \$23/MWH, a REC sale provided \$1/MWH ($\$1/\$67 = 1.5\%$). If the PTC is excluded (it was suspended for projects beginning construction after 2013), the REC proportion of income is 2.3% Source: [EIA Wholesale Electricity Prices](#)
- ¹¹ “Since the REC Program is voluntary for Generation Entities, some renewable generation in the state may not be registered in the REC Program.” Ercot [Annual Report on Renewable Energy Credit Trading Program](#) 2013.
- ¹² [Green Power Markets](#), U.S. Department of Energy, retrieved Nov. 2014
- ¹³ Oklahoma has 3,134 MW of wind capacity, all available for the voluntary market. Iowa’s RPS calls for only 105 MW, and Iowa had 5,177 MW of wind capacity installed in Sept. 2014. The Texas RPS calls for 5,880 MW of renewable capacity by 2015; Texas had more than double that amount, or 12,976 MW of wind capacity, in Sept. 2014. Wind capacity from [AWEA Q3 2014 report](#), RPS from DSIRE; Texas surplus calculations from: Ercot [Annual Report on Renewable Energy Credit Trading Program](#) 2013.
- ¹⁴ 2012 [Green-e Verification Report](#), page 4
- ¹⁵ [Walmart](#) 2013 – page 5
- ¹⁶ [Google](#) 2013
- ¹⁷ WRI [Corporate Renewable Energy Buyers’ Principles](#), 2014
- ¹⁸ [Why the World’s Largest Companies Are Investing in Renewable Energy](#), CERES
- ¹⁹ [Sprint](#), 2012
- ²⁰ [Status and Trends in the Voluntary US Green Power Market](#), NREL Oct. 2013

APPENDIX

Renewable Capacity Contribution (RCC)

This metric estimates the expected impact of a particular renewable energy purchase option on creation of new renewable capacity. The metric is expressed in terms of watts of new capacity per megawatt-hour of electricity purchased.

- For direct investments or power purchase agreements (PPAs), we have assumed the new capacity created is that which is needed to produce one megawatt-hour of electricity in a year. Based on U.S. averages for 2013, this is around 571 watts for solar PV panels, and around 327 watts for wind turbines.
- For REC purchases, we have used the average growth rate in U.S. wind capacity over the past 5 years (25% annually) and determined what part of the growth from a baseline of 327 watts can be attributed to a REC purchase based on the proportion of a wind farm's revenue that comes from sale of RECs.

Findings

As you can see, direct investments in onsite or community solar, or the signing of long-term PPAs enabling projects to be built, are far superior to purchasing RECs, from a new capacity point of view. These purchase options also work in different ways; some options directly create new capacity, and others send a signal to others to invest their own money in new capacity. The strength of the market signal varies based on the amount of money spent on the RECs, and the proportion of renewable energy generators' total income the RECs represent.

The table below contains the calculations shown in the graphic on page 11.

Expected Renewable Capacity Contribution for 1 MWH purchased		
Renewable Procurement Option	Direct Renewable Capacity Contribution	Market Signal for others to invest in new capacity
Onsite or Community Direct Investment	~327 watts (wind) ~571 watts (solar)	Local leadership
Long term Power Purchase Agreement (PPA)	~327 watts (wind) ~571 watts (solar)	High visibility leadership
Short term PPA - local (NEPOOL) bundled electricity & RECs	None	55-82 watts (70-100% of revenue)
Local unbundled RECs (NEPOOL, \$15)	None	10-12 watts (8-10% of revenue)
National unbundled RECs (ERCOT, \$1)	None	1 - 2 watts (1-2% of revenue)

Note: A vertical arrow on the left side of the table points upwards and is labeled "Preferable".

Callout boxes:
 - Green box: Capacity built to generate 1 MWH per year
 - Yellow box: Share of expected 25% annual growth in wind capacity (82 watts) attributable to market signal

APPENDIX

Calculations and Sources

Average Capacity Factors: 35% and 20% are the 2013 U.S. average capacity factors for wind and solar PV; [Open EI](#) / Transparent Cost Database

Installed capacity needed to generate 1 MWh of electricity in a year

- 327 watts of wind: at a capacity factor of 35%, $(327 * 24 * 365 * .35 = 1 \text{ MWh})$
- 571 watts of solar PV: at a capacity factor of 20%, $(571 * 24 * 365 * .20 = 1 \text{ MWh})$

Growth in Wind Capacity

- 25% annual growth in wind capacity – AWEA average growth rate over 5 years ending 2013
- 82 watts is 25% growth expected from base of 327 watts of wind needed to generate 1 MWh.
- The portion of this 82 watts attributable to a specific purchase depends on the share of the generator's total revenue that purchase represents. Ranges are with and without the PTC.

Wholesale electricity prices

- NEPOOL (\$0.081/kWh) and ERCOT (\$0.043/kWh) average [2014 wholesale electricity prices](#) used to estimate generator's revenue from sale of electricity.