

Note: This white paper was completed July 14, 2021. Since that time the price of generic RECs has increased by more than 50%, settling at \$5.75 per MWh.

Re-assessing Carbon Mitigation Strategies

By: Craig Schuttenberg

Summary

In the next several decades it will be extremely difficult, if not impossible, for most corporations and institutions to reach the ultimate goal of zero carbon emissions through individual efforts within their respective spheres of influence. They are limited by available space, affordable technologies and funding in their quest to rein in their carbon emissions to get anywhere close to “Carbon Neutrality.” Despite this seemingly insurmountable task, there is constant pressure to show stakeholders (i.e., customers, shareholders, employees, students, etc.) that they are serious about addressing global climate change. So how will they get to the golden fleece level of Carbon Neutrality? Third party mitigation strategies will be key.

This white paper is written for those within corporations and institutions making financial and environmental decisions regarding the procurement of available carbon mitigations vehicles – specifically Carbon Offsets and Renewable Energy Certificates (RECs). Both Carbon Offsets and RECs are nationally and internationally accepted carbon mitigation measures. Per the US EPA:

While both Offsets and RECs can help an organization lower its emissions footprint, they are different instruments used for different purposes. Think of Offsets and RECs as two tools in your sustainability tool box – like a hammer and a saw.¹

Although Carbon Offsets and RECs have the same ultimate effect of mitigating carbon emissions, they are by no means the same in their efficacy, financial performance or how they address social and environmental issues. Their differences, advantages and drawbacks will be highlighted and examined. A lot has changed since RECs were conceived over 25 years ago – markets have matured, new environmental and social trends have emerged and climate action awareness has been heightened. The purpose of this white paper is to update and integrate relevant, publicly available data to facilitate a more complete corporate environmental response when making the purchase decision between Carbon Offsets and RECs.

Background on Carbon Mitigation Alternatives

Renewable Energy Certificates

Renewable Energy Certificates (RECs) are the environmental attributes associated with the generation of electricity from renewable energy sources such as wind, solar, low-impact hydro, bio-mass or landfill gas. One of the main objectives of RECs was to institute a process that would allow any entity to participate in the renewable energy revolution irrespective of where your facility was located. The concept was laudable as not all consumers of electricity had the opportunity to purchase electricity from alternative generation sources. Renewable energy generators would feed their electricity output to the nearby grid and environmentally aware consumers would support their efforts by purchasing RECs. Along with displaying their support of renewable energy, these consumers would receive all rights associated with the renewable energy generation. RECs are a straightforward, easy-to-use instrument for reducing a corporation's or institution's carbon footprint. And accounting is simple – each REC offsets one MegaWatt-hour of electricity usage (i.e., 1,000 kWhs) in one's corporate carbon assessment of Scope 2 emissions.

Carbon Offsets

Carbon Offsets result from projects that avoid, reduce or remove greenhouse gases (GHG) from the atmosphere. The unit of measure for Carbon Offsets is one Metric Tonne of CO₂ equivalent (MTCO₂e). Like RECs they are subjected to third-party certification to ensure compliance. But unlike RECs, they can be used to reduce any Scope 1, 2 or 3 carbon-emitting source from your facility's carbon footprint accounting, including electricity purchases. (Note: RECs are limited to mitigating Scope 2 carbon emissions). And because the direct beneficiary of Carbon Offsets is the earth's atmosphere, projects generating offsets can be located anywhere on the planet with equal efficacy.

Definitions, Strengths and Limitations of RECs and Carbon Offsets

GHG Emission Accounting

There are several accepted methodologies for the accounting of greenhouse gas (GHG) emissions. The idea is that while a corporation might not have total control of GHG emissions that result from all its business activities, it still has the responsibility to account for them.

In the accounting process, GHG emissions are classified as Scope 1, 2 or 3 emissions.

Scope 1 covers direct emissions from owned or controlled sources.

Scope 2 covers indirect emissions from the generation of purchased electricity, steam, heating and cooling consumed by the reporting company.

Scope 3 includes all other indirect emissions that occur in a company's value chain.

RECs: Carbon Footprint Accounting with RECs couldn't be easier – one REC mitigates one megawatt-hour of purchased electricity (i.e., 1,000 kWh). However, they can only be used for offsetting third party purchases of energy – a Scope 2 emission.

Carbon Offsets: Carbon Footprint Accounting is different than that for RECs, but their application is more expansive. One Carbon Offset mitigates one metric tonne (2,204.6 lbs) of carbon dioxide equivalent in greenhouse gases (GHG). Carbon Offsets are more versatile as they can be used to mitigate any Scope 1, 2 or 3 emission.

Test of Additionality

Additionality requires that the sale/purchase of an offset goes to funding the associated project and is critical in bringing that project to fruition. Simply put, for a project to stand the test of additionality, it has to prove that the project would not exist if it didn't have funding from the sale/purchase of the associated offsets – or put another way, “Does the money spent on the offset result in material environmental benefit?”

RECs: Since the inception of RECs, they have not been required to prove additionality. Most domestically produced RECs in the voluntary market come from Wind Turbine Generators. Seminal to these projects being constructed is a very generous federal Production Tax Credit (PTC). As with most federal programs, the PTC was funded for a specific length of time and had to be extended every few years. In the past, when the PTC was not extended, Wind Turbine project development ground to a halt.^{2, 3}

No one can dispute that the sale of RECs has increased over the same time period as the wind generation industry has flourished – but, did the sale of RECs result in more renewable energy plants being built? With the PTC having averaged more than 10 times the value of the RECs sold into the voluntary market, and with the PTC being a guaranteed 10-year revenue stream for the wind generators, it seems reasonable to conclude that the PTC, and not the sale/purchase of RECs, was seminal to the development and expansion of the wind industry.

Carbon Offsets: Unlike RECs, Carbon Offsets are required to stand the test of additionality. The money spent on project-generated offsets must be necessary for the project coming to fruition. Therefore, purchasing a Carbon Offset results in projects coming to fruition – and the environment benefits from the purchase.

1 REC ≠ 1 Carbon Offset

To further add to the confusion between RECs and Carbon Offsets, they are not equivalent in reducing one's carbon footprint – it's a bit of comparing apples and oranges. While they are both used for offsetting carbon emissions, they are neither equivalent in form nor are they equivalent in their efficacy in corporate carbon footprint accounting. For carbon footprint accounting, one REC offsets one MWh of electricity consumption. If you choose to offset Scope 2 emissions with Carbon Offsets, you are offsetting the carbon emitted in the generation of electricity that is delivered to your facility. This is best illustrated by the following example of using Carbon Offsets for offsetting electricity purchased for a facility in New York where ConEd is the local electric utility. The power delivered to all ConEd's customers emits 211.3 kilograms (or 0.211 metric tonnes) of CO₂ per MWh of electricity produced.⁴ Using simple arithmetic, from a carbon accounting standpoint, it can be shown that for a facility in New York, one Carbon Offset mitigates **4.73 times** the carbon of one REC (i.e., 1,000/211.3).

This calculation illustrates corporate carbon accounting with RECs and Carbon Offsets in the New York area. But each utility area has its own unique combination of electricity generation sources; hence the carbon emitted per MWh of electricity consumed is different across the country. Below is the calculation for other areas of the US:

- 1 Carbon Offset = 2.8 RECs in Chicago
- 1 Carbon Offset = 3.4 RECs in Texas
- 1 Carbon Offset = 4.7 RECs in New York
- 1 Carbon Offset = 5.6 RECs in Boston
- 1 Carbon Offset = 6.4 RECs in San Francisco

The takeaway here is that the equivalence between Carbon Offsets and RECs depends upon where your facility is located and how carbon-intensive the electricity grid is in your area. It should be noted that with the Biden administration's expansion plans for renewable electricity generators, the above ratios will only grow and Carbon Offsets will be able to offset more kWhs of purchased electricity, thereby making RECs less cost-effective in the future.

Carbon Offsets Hurdle Price for Scope 2 Mitigation

Until recently, RECs were a cheap way to make an environmental statement that was acknowledged by state and federal governmental agencies, corporations, institutions and the environmentally aware public-at-large. But market conditions have changed – the cost of generic nationally sourced RECs has increased to \$3.50/MWh from less than \$1/MWh eighteen months ago.⁵ This increase in unit cost, coupled with the desire to reduce one's carbon footprint to a greater extent than in the past by purchasing ever-more RECs, is resulting in a line item that is starting to get attention from those in corporate financial management.

As stated above, along with RECs, Carbon Offsets can be used for mitigating Scope 2 emissions. At what price would a Carbon Offset be more cost effective than using RECs for addressing Scope 2 electricity purchases (aka, the Carbon Offset Hurdle Price)?

Using the New York example once again; it takes 4.73 RECs to equal the carbon mitigation ability of one Carbon Offset. At \$3.50/REC, the equivalent value of a Carbon Offset being used for mitigation in New York is \$16.56 (i.e., \$3.50 times 4.73). There are countless projects that offer Carbon Offsets for less than \$16.56 – and this doesn't count any social or environmental justice benefit that could accompany your Carbon Offset purchase.

Choice and Flexibility

RECs – Renewable Energy Certificates supplying the voluntary market are not only constrained by the type of project developed, but also their locations are limited to being able to feed the electric grid in the US. These constraints limit creativity in both the scope of projects developed and the benefits they can offer.

Carbon Offsets – Contrasting with facilities that supply the REC market, projects that generate Carbon Offsets can include a host of worldwide projects that address social and environmental justice issues along with decreasing atmospheric GHGs. This not only enhances creativity in the kinds of GHG-reducing projects developed, but also in how the projects are assembled. Many projects are low-cost and integer in nature, which allows the project to grow along with market demand for the offsets (e.g., wood cookstoves in Africa, etc.). This minimized risk promotes diversity in project types and allows these projects to move forward more confidently. Carbon Offset projects also have the added opportunity of complementing other corporate mission objectives (e.g., “buy-local” or save forests or wildlife habitats).

Carbon Trends

ESG – Many Carbon Offset projects address social and environmental justice, along with reducing GHG emissions. These projects include (but are not limited to): providing efficient wood cookstoves in the developing world; reducing emissions from deforestation; and regenerative land stewardship. Investing in these projects, through the purchase of associated Carbon Offsets, will improve corporate ESG positioning.

Decarbonization –Currently, many entities declare they are “100% green” because they’ve offset their electricity purchases with RECs, totally ignoring emissions from burning gas and oil on site for domestic and process heating, etc. However, with the new focus on decarbonization of a corporation’s total carbon emissions, RECs will not be able to fill this void because they only address Scope 2 emissions. The infinitely flexible Carbon Offsets will be able to fill the gap as they can mitigate all kinds of corporate GHG emissions.

Tech Giants Compete for Renewables – Super-rich tech firms (e.g., Amazon, Google, Facebook, and Microsoft) are buying renewable energy at an ever-increasing rate to show stakeholders that they are actually reducing emissions ⁶. And they are purchasing generation, along with the associated RECs, well into the future, thereby removing REC supply from the market.

Greening of the Grid – According to a report just issued by the Department of Energy, “Halfway to Zero,” since 2005, carbon emissions associated with domestic electricity generation have decreased 40% on a per kWh basis.⁷ Assuming that reducing one’s carbon footprint is central to a corporate environmental strategy, greening of the grid mean that, in relative terms for carbon footprint accounting, RECs efficacy has decreased by 40% over the past 15 years. And the trend is continuing – in 2019, electricity generation from renewable sources accounted for over 60% of the new domestic capacity additions.⁸ With most new electricity generation additions coming from renewable sources, this trend will only accelerate, thereby further reducing the amount of carbon mitigated per REC purchased.

The Path Forward

With the creation and promotion of RECs, the Environmental Protection Agency has done an excellent job of expanding awareness of renewable energy and highlighting its importance in combatting global climate change. However, many things have changed in the 25 years since the inception of RECs – most notable is the emphasis on addressing and mitigating carbon accounting beyond that of only purchased electricity. And with RECs being limited to offsetting carbon emissions from electricity purchases (i.e., Scope 2 emissions), there is a need for a more versatile mitigation vehicle that can address Scope 1, 2 & 3 corporate GHG emissions – enter Carbon Offsets.

There is no one solution – no silver-bullet cure – for what is needed to adequately address global climate change. As the EPA says, we should look at Carbon Offsets as another tool in the toolbox for lowering corporate carbon emissions. But Carbon Offsets are not just another saw or hammer – they are more like a big Swiss army knife, ready to address a multitude of challenges effectively.

Endnotes

¹ https://www.epa.gov/sites/production/files/2018-03/documents/gpp_guide_recs_offsets.pdf
“RECs and Offsets: What the Difference?”

² “While significant U.S. wind capacity additions are expected to continue for the next couple years, growth in the medium-term remains uncertain as the Production Tax Credit is phased out.” Wind and Energy Market Report – 8/6/2019.

³ “The timing and magnitude of wind turbine installations in the United States are often driven by tax incentives.” <https://www.eia.gov/todayinenergy/detail.php?id=46576>

⁴ <https://www.epa.gov/egrid>, Emissions & Generation Resource Integrated Database (eGRID), 2016 data

⁵ Center for Resource Solutions, Webinar, “Renewable Energy Procurement Strategies to Reach Clean City Goals” Christopher Kent, Program Mgr, EPA Green Power Partnership, June 15, 2021

⁶ Wall Street Journal, June 24, 2021, “Tech Firms Snap Up Renewable Energy”

⁷ Halfway to Zero: Progress Towards a Carbon-free Power Sector, Office of Energy and Efficiency and Renewable Energy, US DOE; April 2021

⁸ US Energy Information Industry, Utility Scale Capacity Additions... 2019, (https://www.eia.gov/electricity/annual/html/epa_04_06.html)

For Questions or Comments, author’s contact information:

Craig Schuttenberg
President
Carbonless Community
craig@carbonlesscommunity.com ; (773) 491-1564 (mobile)