Greenhouse Gas Offsets and Renewable Energy Certificates: Distinct Commodities in an Evolving Market
The Climate Trust

Introduction

The framework for future climate policy is emerging in the United States through a number of regulatory and voluntary initiatives at the local, state and regional levels. Concurrently, the market for greenhouse gas emissions reductions in the United States is evolving at an unprecedented rate. Because the United States is not a signatory to the Kyoto Protocol, it is not bound by international accord to reduce its greenhouse gas emissions. However, in the absence of federal regulation of GHG emissions, a rapidly evolving voluntary carbon market has emerged. This market is developing mainly (1) to help counteract climate change, (2) as a means to earn "early actor" status or credits for participating entities, (3) in anticipation of future governmental regulation of greenhouse gas emissions, and (4) to set the groundwork for future participation in international markets. This voluntary market is experiencing dynamic growth and is evolving rapidly as increasing numbers of individuals and organizations take action to reduce their climate impact.

Because greenhouse gases (GHGs) are a ubiquitous externality of our economy, an effective national strategy for combating global climate change will, of necessity, be multifaceted and include a variety of both regulatory and voluntary market mechanisms. These mechanisms include emissions allowances, greenhouse gas offsets, Renewable Energy Certificates (RECs), Renewable Portfolio Standards, and cap and trade programs. How these market mechanisms are treated in the voluntary market will have significant impact on the effectiveness of future climate policy and programs.

Two key market mechanisms that are currently employed in both the voluntary and regulatory markets are greenhouse gas offsets and Renewable Energy Certificates. The respective roles that each of these mechanisms play in the voluntary greenhouse gas market is a matter of much recent debate within the carbon market community. This paper outlines the position of The Climate Trust on the relationship between greenhouse gas offsets and Renewable Energy Certificates, and how each should be considered and treated in the context of the voluntary greenhouse gas reduction market.

Renewable Energy Certificates

Within the last ten years, participants in the renewable energy market have undertaken the commoditization of the environmental benefits of various renewable energy projects. One means of doing this is through what are known as "green tags" or "Renewable Energy Certificates"

(RECs). Renewable Energy Certificates represent the environmental attributes associated with energy generated from renewable technologies such as wind, solar and biomass. This commoditization of environmental benefit was undertaken for a variety of reasons, including:

- to allow renewable energy to adapt to deregulation of the energy market;
- to stimulate the development of renewable energy in the United States;
- to respond to the emergence of the voluntary renewable energy market;
- to nationalize the renewable energy market and overcome transmission constraints; and,
- to provide a mechanism for compliance with Renewable Portfolio Standards.

Understanding how RECs function requires a basic understanding of the power generation and transmission system. When power is generated, regardless of its source, it is added to the electricity transmission system and co-mingled with all of the other power generated in that area; it is then transmitted to the end user. Due to this, it is very difficult to pin-point the source of a unit of energy once it has been contributed to the grid. Renewable Energy Certificates were created to address this short-coming by decoupling the environmental attributes of renewable energy as a commodity separate and distinct from the actual electricity itself. These environmental benefits, though not generally specified or quantified, include reduced levels of particulate air pollution, carbon dioxide, and sulfur dioxide, among others. In essence, one REC represents on megawatt hour of zero emissions electricity.

Greenhouse Gas Offsets

A greenhouse gas offset displaces, avoids or sequesters greenhouse gas emissions through the implementation of a specific project intended to compensate for emissions occurring at another source. A wide variety of technological approaches can be employed to achieve reductions in GHG emissions, including: energy efficiency in buildings, factories, and transportation; cogeneration of electricity from industrial waste heat; shifting to lower carbon energy sources; capturing carbon dioxide in forests and in agricultural soils; and capturing power plant emissions and storing them underground in geological formations.

The essential promise of a greenhouse gas offset is the achievement of a real and verifiable reduction in atmospheric GHG levels equal to reductions that would have been realized by onsite mitigation measures by emitters. Due to the way in which greenhouse gases impact the atmosphere, the location of the emissions reduction is immaterial to its impact. That is, that a reduction in a location different from the emissions source results in the same atmospheric impact as a reduction on site by a mitigating entity. Figure 1 illustrates this point graphically.

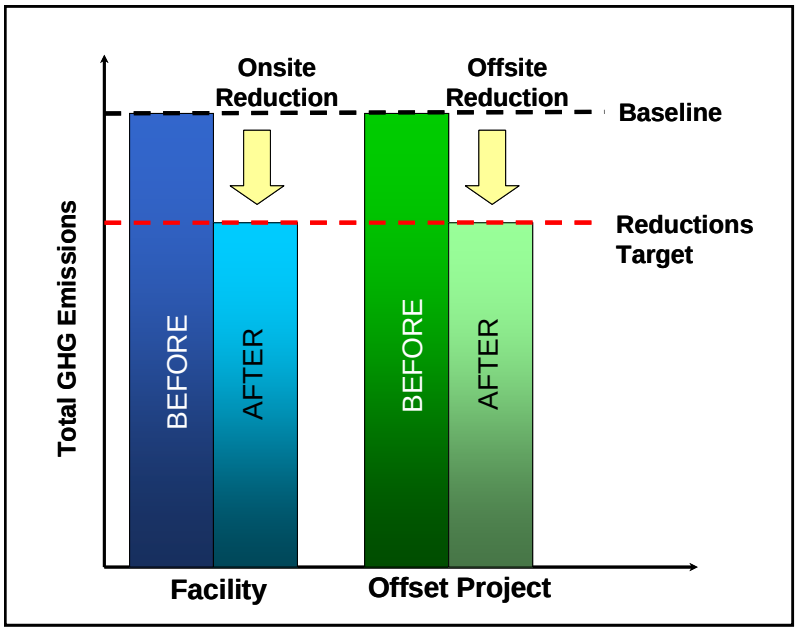

Figure 1. Equivalence of GHG Reduction Projects

A project developer must demonstrate that a greenhouse gas reduction project being used to mitigate emissions on behalf of another source is above and beyond the "business as usual" scenario; otherwise, there is no net reduction of GHG levels in the atmosphere. This concept is commonly known as "additionality". In order to be considered an offset, reductions projects must meet certain standards and criteria, which are intended to ensure that the actual levels of greenhouse gases in the atmosphere will be measurably reduced as a result of the action taken by the reduction project. A project's efficacy in reducing GHG levels is dependent upon three central, commonly accepted, criteria: additionality, a realistic and accurate baseline and on-going monitoring and verification.

1. **Additionality.** Additionality is an essential determinant of the effectiveness of an offset project and one of the most important factors in assessing project quality. Additionality is a policy term by which an assessment is made regarding whether or not a project's emissions reductions are in addition to a business-as-usual scenario. The Climate Trust utilizes a project-by-project additionality assessment, in which a project proponent must demonstrate that it faces barriers to implementation that can be addressed through carbon funding. These barriers can be institutional, technological or financial. Additionality is the metric by which a project demonstrates that it is resulting in a real, measurable reduction in atmospheric levels of greenhouse gases. A non-additional offset project does not measurably reduce the amount of greenhouse gases in the atmosphere.
2. **A realistic baseline.** A realistic baseline must be established in order to assess the effectiveness of a project's reduction of GHG levels. The baseline is intended to demonstrate what greenhouse gas emission levels would have been in the absence of the greenhouse gas

reduction project. Credible greenhouse emissions reductions can only be assessed if the baseline upon which the calculation is based is an accurate and realistic reflection of the business as usual emissions scenario.

3. **On-going monitoring and verification.** Emissions reductions from greenhouse gas reduction projects must be accurately quantified. Each project must have a monitoring plan that defines how, when and by whom the quantification will be done. All emissions reductions must be verified by an independent third party or certification program or agency.

The Importance of Additionality

In any GHG reduction project, additionality is perhaps the most important determinant of a project's effectiveness in reducing atmospheric GHG levels. Moreover, additionality is the attribute that sets greenhouse gas offsets apart from other environmentally beneficial commodities, such as RECs. Additionality is where the proverbial rubber meets the road in assessing the effectiveness of greenhouse gas reduction projects in mitigating GHG emissions levels below what they would have otherwise been under a business as usual scenario. Figure 3 illustrates the importance of additionality in affecting reductions in atmospheric GHG levels.

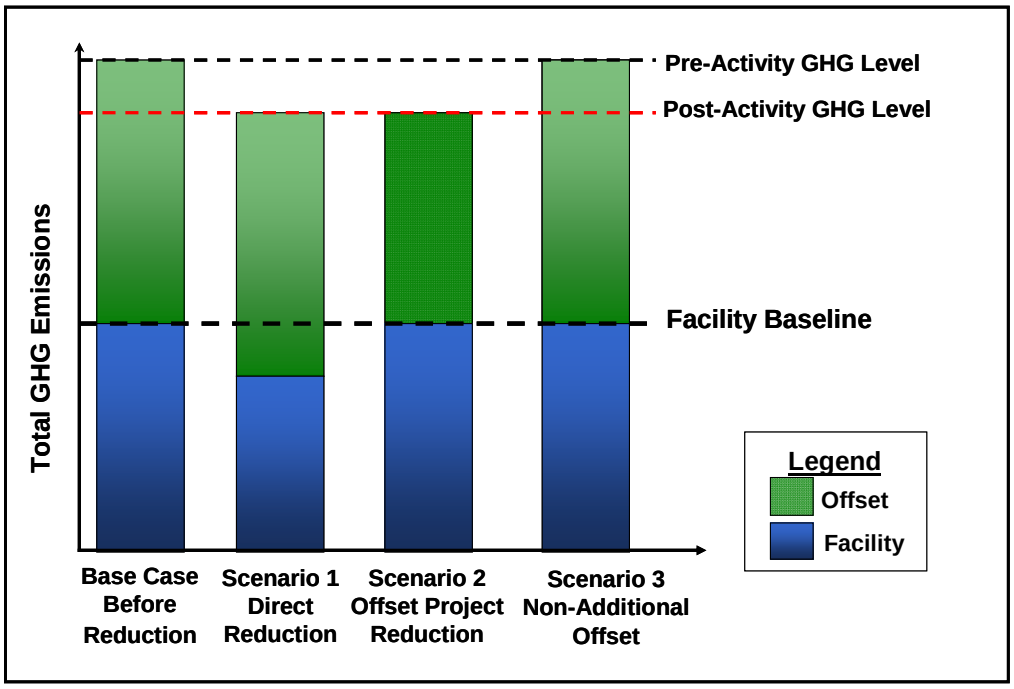

Figure 2. Importance of Additionality in Reducing GHG Emissions

The base case scenario in Figure 2 shows the levels of total GHG emissions resulting from a facility and a business as usual scenario combined (before offset project implementation); this is the scenario against which further reductions are measured. Scenario 1 illustrates the impact on

atmospheric GHG levels resulting from onsite reductions, such as the installation of emissions reduction technology at a factory, conducted by an emitting facility. In this scenario, the total facility emissions are reduced below the facility baseline (the facility emission levels before mitigation activity) as a result of the onsite reduction project, in this example, emissions controls. The actual levels of GHGs in the atmosphere are reduced as a result of the direct reduction.

Scenario 2, offset project reduction, shows the impact of a greenhouse gas reduction project, or offset project on GHG emissions levels. In this scenario, the reductions result from action taken by an offset project in a location other than the facility. The facility's emissions have not changed, but the greenhouse gas reduction project's emissions are lower, resulting in a measurable reduction in overall greenhouse gas emissions levels. The end result, reduced greenhouse gas emission levels, is the same in both Scenario1 and Scenario 2.

In Scenario 3, a non-additional offset project is deployed, but because the results of the project are not above and beyond the business as usual scenario, no real and quantifiable reductions in GHG levels occur.

Greenhouse Gas Offsets and Renewable Energy

Greenhouse gas offsets were developed in response to the emergence of the demand for greenhouse gas reductions and regulation, and the need for near term, cost-effective means of achieving greenhouse gas emissions reductions. Renewable Energy Certificates were developed in response to the deregulation of the energy market and to represent the environmental benefits associated with renewable energy. Both offsets and RECs constitute the commoditization of intangible benefits resulting from particular activities or projects, but are distinct commodities with different criteria, and should be treated as such in both the voluntary and regulatory markets.

Renewable energy projects result in a host of environmental benefits, most notably the absence of GHG emissions and reduced particulate matter that contributes to air pollution. In order to determine whether or not a renewable energy project is eligible to generate RECs or greenhouse gas offsets, the project must be evaluated using the respective criteria of a REC or a GHG offset. According to the Green-e Renewable Electricity Certification Program, the nation's largest certifier of RECs, in order for a project's environmental attributes to be considered a REC, the project must meet two key criteria: it must have been built after 1997, and it must not be required by law (e.g. a Renewable Portfolio Standard). If a renewable energy project meets these criteria, the environmental attributes resulting from the project's electricity generation can be certified as a REC and sold as such.

As discussed previously, in order for a project's environmental attributes to be considered a GHG offset, it must meet three, generally-accepted, key criteria. First, and most importantly, a project must have demonstrated additionality. Moreover, a project's reductions must be based on a

realistic baseline and must be monitored and verified over time in order to assure the accuracy and validity of the emissions reductions. High quality greenhouse gas offsets can be generated from renewable energy projects, provided that they meet the criteria for offset projects.

However, Renewable Energy Certificates are a fundamentally distinct commodity from carbon offsets because their essential criteria are different from those of offsets. Renewable Energy Certificates, by definition, are not necessarily additional, while a fundamental criterion of an offset is additionality. Renewable energy projects can result in greenhouse gas offsets, or RECs, or potentially both, but RECs should not be considered offsets, primarily because they do not adequately demonstrate additionality. Figure 3 illustrates the respective criteria for both RECs and GHG offsets that a renewable energy project is evaluated by, and the distinct commodities that emerge after that evaluation.

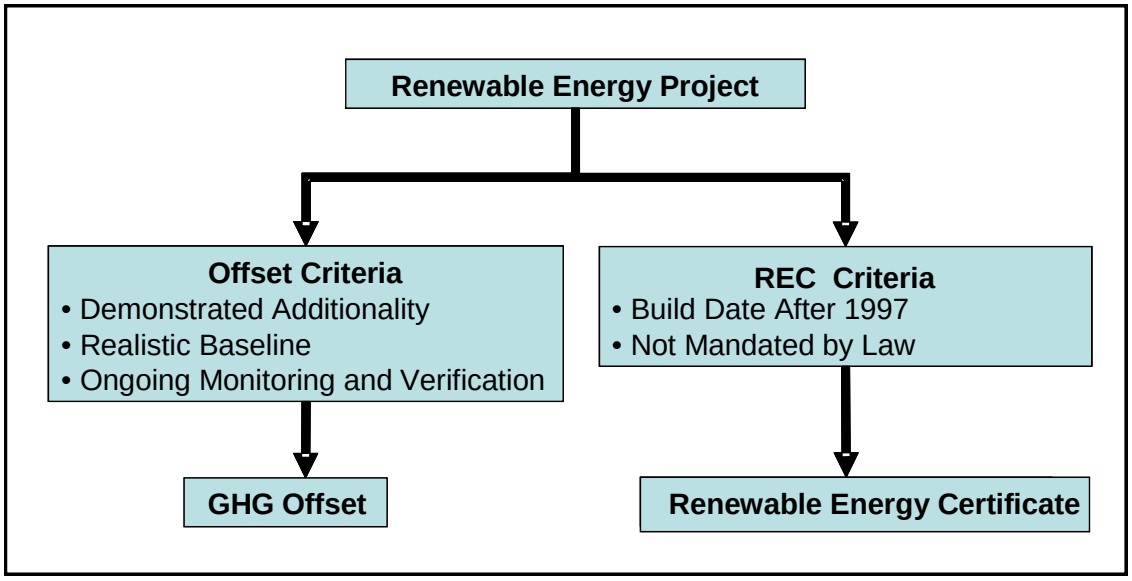

Figure 3. Greenhouse Gas Offset and REC Criteria

Coal Plants, Wind Farms and Additionality- An Example

Imagine a very simple power system, with equal amounts of electricity delivered from one coal plant and one wind farm. Policy mandates that the coal plant reduce its emissions by 25% and allows for the use of greenhouse gas offsets. As long as the wind farm had not been built before 1997 and had not been built in response to a regulatory mandate (such as a renewable portfolio standard) then that project could sell RECs. If RECs are allowed as offsets, the coal plant could purchase RECs from the wind farm sufficient to meet this regulatory requirement. Nothing would change in the real world except for this financial transaction, but the coal plant would achieve nominal compliance with the regulation. The underlying mix of the grid would still be half wind and half coal, and the coal plant would continue to emit the same amount of

greenhouse gases. The overall atmosphere would not register a reduction equal to the coal plants' requirement to reduce, or equal to potential onsite mitigation activities implemented by the coal plant.

In this case, because the renewable power generator was an already existing part of the area's greenhouse gas emissions baseline, purchasing the RECs from the wind power plant would have no real, or measurable, impact on actual GHG levels. For this reason it is important that renewable energy projects be subject to the same criteria as any other greenhouse gas reduction project, regardless of whether or not the project produces RECs. This case clearly illustrates the point that something as good as renewable energy can be "environmentally beneficial", as represented by the emissions free electricity being contributed to the grid, without meeting the higher standard of being "environmentally additional."

An example of an additional greenhouse gas reduction project in this context would be if the same coal plant contracted with the wind farm to add an additional 25% capacity to their wind generation system, and agreed to purchase the greenhouse gas offsets resulting from the addition of the new wind capacity. In this case, the wind capacity was expanded specifically to compensate for 25% of the emissions stemming from the coal plant, and clearly would not have been expanded were it not for the funding provided by that plant. This scenario is a clear demonstration of additionality because it was specifically implemented to compensate for emissions from the coal plant.

Baseline versus Base Year

The CRS green-e standard requires that projects be built after a base year, which is 1997. A base year, in and of itself does very little to demonstrate additionality. Moreover, the strongest arguments for additionality can be made for projects that have not been implemented yet. It is very difficult to show retroactively that offset funding was an integral part of a project that has already been implemented. The mere fact that a project was built after a certain year does little to illustrate the role that greenhouse gas reduction considerations played in a project's development and implementation.

As discussed previously, the basis of an additionality assessment for a greenhouse gas reduction project is what is commonly known as the "emissions baseline." The baseline is intended to demonstrate what greenhouse gas emission levels would have been in the absence of the greenhouse gas reduction project. The emissions baseline is used to establish whether or not a project's mitigation activities are above and beyond the business as usual case, or the baseline scenario. A realistic baseline must be established in order to assess the effectiveness of a project's reduction of GHG levels.

Conclusion

Both Renewable Energy Certificates and greenhouse gas offsets have important roles to play in combating global climate change and transitioning to a lower carbon economy. The

environmental benefits of renewable energy are real and should be acknowledged and promoted in existing and future regulatory frameworks through means such as renewable portfolio standards and other measures. Moreover, renewable energy projects should be allocated allowances under future regulatory regimes in order to promote the continued development of renewable energy sources.

Renewable energy projects are a desirable source of greenhouse gas reductions, provided that they meet the criteria of offsets. However, RECs and offsets should be treated as distinct commodities in the voluntary market and in existing and future regulatory regimes in order to assure the greatest environmental integrity. Renewable Energy Certificates generated by renewable energy projects are not by default additional, and therefore qualified as an offset, but must be evaluated based on the conditions of the underlying project.

Being clear about the difference between environmental benefit and environmental additionality will assure the most effective deployment of tools with which to address global climate change and affect real, measurable reductions in GHG levels. By ensuring the greatest environmental integrity possible and the verifiable reduction of greenhouse gases in the voluntary carbon market, both RECs and offsets can continue to contribute effectively to a comprehensive climate change mitigation policy framework.