The Set-Aside Mechanism to Incorporate Energy Efficiency and Renewable Energy into Cap and Trade

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This paper provides an overview of key greenhouse gas (GHG) cap and trade design issues to distinguish energy efficiency and renewable energy (EE/RE) GHG reduction credits from "offsets" created by direct emissions reduction projects. The aim is to show how a properly designed carbon market that integrates a set-aside mechanism (in addition to an offset provision) facilitates the development of "indirect" GHG reduction projects from entities such as local governments. Additionally, the Local Government Sustainability Commission comments that establishing a cap and trade program that permits local government EE/RE projects access the carbon market enhances the value and function of existing policies, including ratepayer-funded, utility-run programs. As acknowledged in the Western Climate Initiative Design Recommendations, using market resources to implement cost-effective energy efficiency projects complements non-market programs that address other barriers.[1]

1. Introduction

Cap and trade programs designed to control GHG emissions have emerged as a favored policy tool to address climate change. Among other benefits, well constructed programs have the potential to align two key objectives: 1) maintain environmental integrity by setting a firm limit on the emissions produced by capped sources participating in the program, and 2) achieve the least cost GHG reduction solution by creating emissions trading markets that facilitate the implementation of GHG reduction activities with the lowest marginal abatement cost.

Energy efficiency projects to save electricity are widely recognized as a top-tier approach to attain low cost GHG reductions.[2] Since the projects are implemented and save energy at facilities owned and operated by entities usually not included in cap and trade programs, the GHG reductions are most frequently associated with "offsets." As a result, discussions to incorporate energy efficiency projects into market-based systems often result in a dead-end, due to challenges involving "double counting." Likewise, grid-connected renewable energy projects can also result in double-claims on the associated GHG reductions.

The Western Climate Initiative (WCI) Cap and Trade Design Recommendations states that "[p]roject types that reduce emissions covered by the cap-and-trade system would not be eligible to create offsets because the result would be a double counting of the emission reduction." (p.10) However, an alternative approach to the offset provision exists that could enable energy

[1] WCI Design Recommendation, Background Document, September 23, 2008, p. 59.
[2] *Reducing U.S. Greenhouse Gas Emissions: How Much at What Cost?,* U.S. Greenhouse Gas Abatement Mapping Initiative Study (McKinsey & Company et al., December 2007).
http://www.mckinsey.com/clientservice/ccsi/pdf/US_ghg_final_report.pdf

efficiency initiatives to access the carbon market – the allowance set-aside mechanism. Indeed, WCI recommends a market design that explicitly recognizes the GHG reductions from energy efficiency through the creation of an allowance set-aside pool. (Recommendation 8.2, p.7).[3]

The Local Government Sustainable Energy Coalition (LGSEC) is an association of California public entities formed to support their communities' commitment to a sustainable energy future.[4] LGSEC encourages WCI to implement its recommendation to set aside cap and trade allowances; their purpose should be to serve as GHG reduction "credits" for local government energy efficiency and renewable energy projects. The set-aside credits should be fungible with allowances held by capped entities and thus used for compliance purposes. The set-aside mechanism is different than a direct GHG reduction offset provision.

Furthermore, the set-aside mechanism would supplement the local government initiatives in the California Air Resources Board's (CARB) Scoping Plan. That is, LGSEC urges the development of a market-based program under California's AB32 initiative, which incorporates a set-aside pool of allowances that could be earned by local governments, in addition to other regulatory initiatives targeted for them. LGSEC also encourages federal policy makers to consider designing a program that would enable EE/RE projects to participate in the carbon market through a set-aside mechanism.

2. Creating a GHG Cap and Trade Program that Incorporates EE/RE Projects

This section provides an overview of cap and trade design issues to highlight market entry mechanisms that could support local government sustainability initiatives. It explains why a set-aside mechanism is needed to incorporate EE/RE into a cap and trade program, and how it functions similarly to an offset provision while preserving environmental integrity.

a. An overview of cap and trade

Cap and trade programs work by setting a limit (or cap) on the aggregate total emissions for the entities selected to participate in the program. Generally, companies/entities with large GHG sources that produce emissions above a threshold – power generation facilities, cement plants, industrial complexes, for instance – are covered by the cap. Over time, the program achieves GHG reductions as the cap declines. Figuratively, the cap is like a bubble that encompasses GHG sources; as the bubble constricts GHG emissions decrease.

A crucial cap and trade program design feature is the "emissions permit" (often referred to as an "allowance"), which capped entities must hold and ultimately submit to the program authority for every tonne of GHG emitted into the atmosphere. Each allowance corresponds with a permit to produce one unit of emissions, most commonly expressed as one metric ton of carbon dioxide equivalent ($MTCO_2e$). The total number of permits equals the total allowable emissions under the cap. For example, a program with an emissions limit (i.e., cap) of one million $MTCO_2e$

[3] www.westernclimateinitiative.org
[4] http://www.lgc.org

would make available one million allowances/permits for capped entities. At the end of each compliance period, companies participating in the program surrender allowances equal in number to the total tonnes of GHGs emitted.

Another key feature of the program pertains to trading allowances, wherein companies with more emissions than allowances buy permits from those who have extra because they pollute less. In effect, the buyer is paying an additional charge for producing emissions in excess of its allowances, while the seller is rewarded for having reduced emissions. Although, allowances change hands between capped entities within the program bubble, the total emissions remains limited to the level of the cap.

The environmental integrity of the program is measured by matching allowances/permits to actual emissions; it is preserved as long as actual emissions do not exceed the number of permits. The least-cost reductions aspect of the program is achieved by allowing the most cost effective GHG reductions to occur anywhere within the cap and be available for any entity under the cap.

A fully functional cap and trade program could restrict trading to just allowances/permits held by companies with capped sources – i.e., power generators and other industrial facilities. In this case, GHG sources outside of the program (due to practical or economical reasons related to their size, location, or other criteria) are prohibited from participating. However, the effectiveness of this type of program is limited, as GHG sources with potential to achieve low cost reductions are not involved in trading.

b. The baseline-and-credit mechanism to incorporate GHG reductions that occur outside the cap and trade program

A program design feature to augment the availability of low-cost reductions involves creating "windows of entry" into the cap and trade system, applicable to non-capped sources that implement discrete GHG reduction projects.[5] A general term for this approach is called a baseline-and-credit mechanism.[6] The GHG reductions created by non-capped sources are often referred to "credits" and trade with allowances held by capped entities. The non-capped entity sells the credit to the capped entity to offset the emissions for which it has no corresponding allowance.[7] The rationale for allowing baseline and credit mechanisms to participate in the carbon market is that market price signals trigger GHG reductions from non-capped entities with

[5] A GHG project is a specific activity or set of activities intended to reduce GHG emissions, increase the storage of carbon, or enhance GHG removals from the atmosphere. It may stand-alone or be a component of a larger non-GHG project, and may be comprised of one or more emissions reduction activities. In the context of this paper, a GHG reduction project would occur at sources outside the cap, or be undertaken by an entity that does not have responsibility for GHG sources under the cap.

[6] Credits are created by reducing emissions below a determined threshold – the baseline. The difference between the baseline emissions (pre-project) and the level of actual GHG emissions (post-project) equals the credit.

[7] The term "offsets" is often used to refer to the universe of GHG reductions from sources not obligated to reduce emissions, which are then sold to balance emissions produced from other GHG sources and activities. This paper uses "offsets" to exclusively refer to GHG reduction credits from direct emission reduction projects

low marginal abatement costs. Ultimately, this would not have occurred if not for the possibility to receive payment from (i.e., to trade with) a capped source.
The overall integrity of the cap and trade program is maintained because emissions from capped sources without a corresponding GHG allowance are balanced by actions from entities outside the program that result in the reduction, removal, or avoidance of emissions.

The GHG reductions from baseline and credit projects used for cap and trade compliance must meet criteria to demonstrate an environmental benefit equivalent to the allowances for which the credits are substituted. The basis for demonstrating that credits are equivalent to allowances and do not undermine the environmental integrity of the cap is accomplished by showing that the projects yield GHG reductions that are real, permanent, verifiable, enforceable and additional beyond those that would otherwise occur under business as usual.[8]

The energy efficiency and renewable energy community has deep, relevant experience designing, implementing, measuring, monitoring, and verifying the impact of projects to meet the high-quality standards required by cap and trade programs. Appendix A provides information and resources to address potential concerns about the feasibility of energy efficiency projects to demonstrate additionality, quantify the difference between baseline and project emissions, and monitor project performance.[9]

While all baseline and credit projects must equally substantiate the viability of their reductions (in order to be used for compliance purposes), EE/RE projects that reduce electricity use have a different impact on the cap than projects that reduce emission directly at non-capped GHG sources. This is due to generally accepted GHG accounting procedures, which differentiate "direct" and "indirect" emissions. Therefore, when constructing a cap and trade program the effect of direct versus indirect projects on the cap must be addressed.

c. Direct offset projects and indirect EE/RE projects

A key issue when characterizing GHG reduction projects is the concept of "scope," which (in the realm of GHG accounting) is used to delineate direct and indirect emissions sources. Direct emissions occur from sources owned and controlled by a reporting entity. Indirect emissions happen because of one entity's actions but are ultimately produced from sources owned and controlled by another entity.
Emissions associated with purchased and consumed electricity (where the GHGs are produced at a power generating facility but reported by end-users based on electricity consumption) are the predominant type of indirect emissions.[10] Necessarily, indirect emissions from electricity use correspond with, and double count, direct emissions from power generation.

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[8] AB 32 specifically includes criteria for demonstrating the legitimacy of project offsets, Section 38562(d)(1).
[9] LGSEC recognizes that all GHG reduction projects outside the cap must be real, additional, verifiable, and permanent. For the purposes of this paper, LGSEC categorizes the demonstration that a GHG reduction project meets these criteria as an implementation issue, in comparison to the program design issue of creating a "set-aside" pool of allowances accessible to EE/RE projects.
[10] CARB states that ""Direct emissions" means greenhouse gas emissions from sources that are under the operational control of the operator." Indirect emissions are not required to be reported to CARB, but energy use is;

For reporting purposes associated with entity/corporate-level GHG inventories, "double counting" emissions production among different reporters is tolerated to promote comprehensiveness, and to reflect the reality that for many companies organizations and institutions the GHGs from electricity use significantly contribute to their total emissions profile. However, LGSEC emphasizes the distinction between double-counting emissions *production* on the one hand, which is accepted, and double-counting emissions *reductions* on the other.

If the cap and trade program does not mitigate the double-counting of GHG reductions associated with projects that decrease indirect emissions a design flaw will become apparent and unavoidably lead to emissions exceeding the cap and undermine the environmental integrity of the program. The problem occurs because while GHG reductions from decreased energy use may be caused by the energy efficiency project outside the cap, the change in emissions actually manifest at power generation facilities within the cap. The result is a double-claim on the project's reductions – by an entity outside the cap and an entity within the cap – and due to the trading feature of the program, emissions exceed the cap. (LGSEC recognizes that WCI anticipates the double-counting issue associated with indirect GHG reduction projects, as pointed out above.)

Alternatively, for projects that reduce emissions from sources that reside outside the cap and do not decrease emissions from sources within the cap only the project developer can claim the reductions. Therefore, double counting does not materialize in this case. In the context of this paper, these types of project are called direct offset projects.

A cap and trade program with an offset provision that comprises direct offset projects and "indirect" GHG reduction projects will undermine environmental integrity. Figure 1 illustrates how treating indirect GHG reductions the same as those from direct offset projects results in double counting: First, by the project developer because it implemented the project and caused the reductions, and Second, by the power generators putting power on to the grid because they own the GHG sources where the reductions actually occur.

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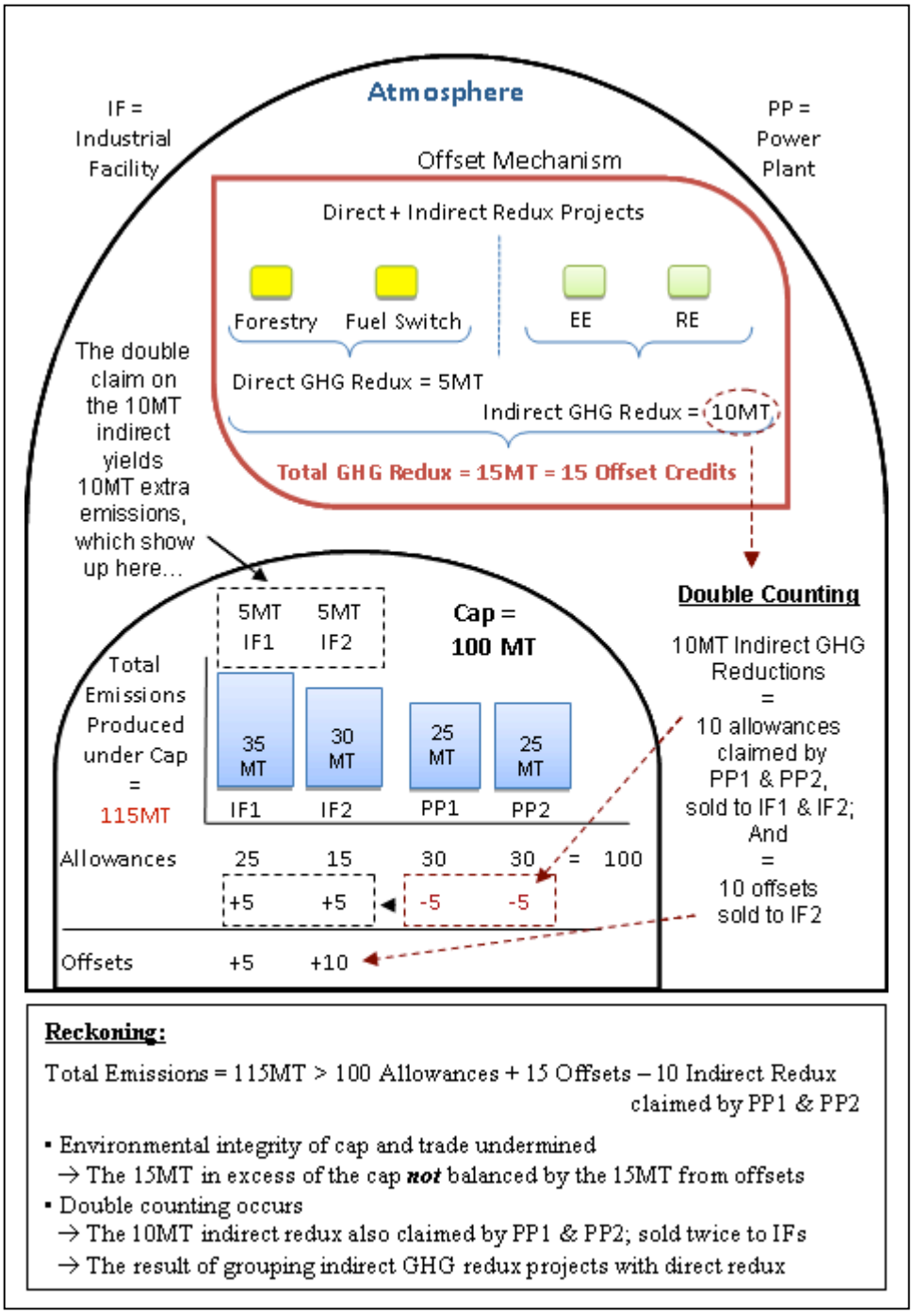
analogous to direct emissions, the CARB reporting rule defines indirect energy as the "electricity, thermal, or other energy sources provided by a retail provider or facility not owned or operated by the user of the energy" see the CARB mandatory GHG reporting rules www.arb.ca.gov. The WCI draft mandatory reporting rules applies to facilities that directly emit GHGs, www.westernclimateinitiative.org. WRI defines three scopes of emissions: Scope 1 = direct emissions, Scope 2 = indirect emissions from purchased and consumed electricity, and Scope 3 = other indirect emissions – see the GHG Protocol, www.ghgprotrocol.org. Entities participating in The Climate Registry TCR program are required to distinguish between direct and indirect emissions according to Scope 1 and Scope 2, www.theclimateregistry.org/resources/protocols. Both WRI and TCR explain and organize direct and indirect emissions as a GHG report "boundary" issue.

Figure 1: Treating EE/RE Reductions as Offsets Leads to Double Counting



However, the challenges associated with incorporating EE/RE GHG reduction projects into a cap and trade program are not intractable. The solution to the double-counting problem involves a market design provision called a "set-aside" mechanism. It reflects the difference between direct and indirect emissions and separates indirect GHG reductions, such as from energy efficiency and renewable energy projects that save or displace grid-delivered electricity, and

GHG reductions associated with direct offset projects (e.g., methane destruction at a dairy operation).

d. The set-aside mechanism in cap and trade to support EE/RE projects

If policymakers support increasing the effectiveness of a cap and trade program, then energy efficiency and renewable should top the list of GHG reducing activities to promote. The best way to empower energy users to develop and implement electricity saving and clean energy projects is to grant them access to the carbon market. In order to create a "window of entry" into the cap and trade program for EE/RE projects, an allowance set-aside mechanism (which is different than a direct offset provision) must be created to avoid double-counting GHG reductions and preserved the integrity of the overall initiative.

Under a set-aside mechanism, the cap and trade program authority dedicates a portion of the total emission allowances to one or more specific purposes. This fraction of allowances is divided from the total pool distributed to capped entities, and reserved for special initiatives or a defined set of market participants. Generally, the rationale is to offer incentives for preferred activities (such as energy efficiency) or technologies (like renewable energy generation) that could contribute to meeting the program's objectives but exist outside the scope of the cap.

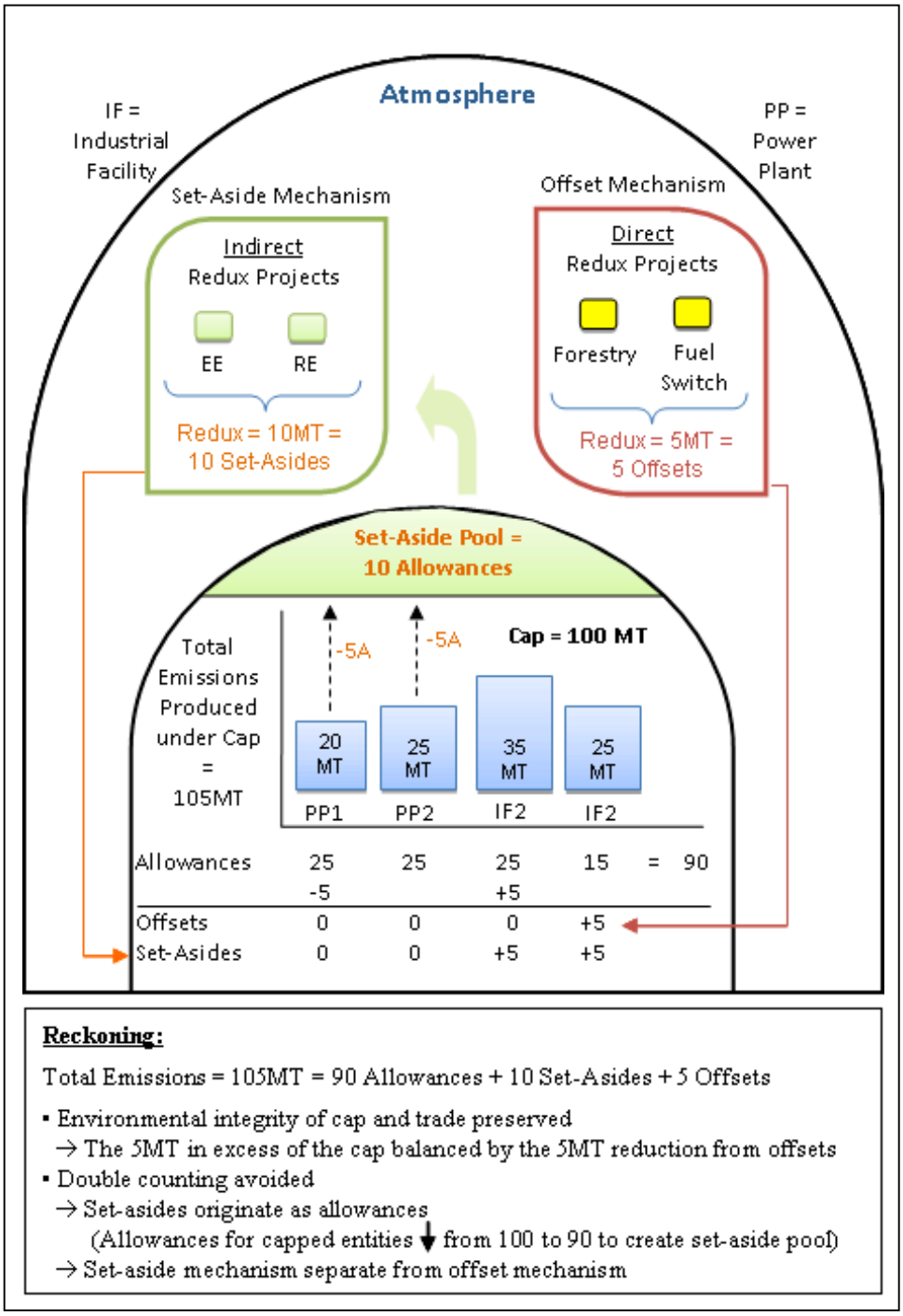
Creating a "set-aside" does not increase the overall level of the cap; it consists of program allowances that would otherwise be distributed to capped entities. Therefore, a set-aside does not jeopardize the environmental integrity of the program. In effect, it reduces the number of allowances available for capped entities and then redistributes them to other market participants. The sum of allowances plus set-aside "credits" equals the emissions cap.[11]

With respect to incorporating EE/RE projects into a cap and trade program, the set-aside mechanism mitigates double counting because it contains real permits to emit (i.e., allowances) from capped entities, which are eventually reconciled with actual emissions produced under the cap. Since projects that save electricity reduce emissions from sources under the cap, the corresponding GHG reduction credits (i.e., the set-asides) are derived from program allowances. When the program authority deducts the allowances from the total pool available for capped entities and moves them to the set-aside pool, the GHG reductions associated with the EE/RE project are effectively, immediately realized. This transfer is equivalent to assigning the GHG reduction to the set-aside pool. Thus the right to claim the GHG reductions from the EE/RE project (expressed in set-aside allowances) is conveyed to the project developers eligible to access the set-aside pool, who then sell them back to the capped entities.

Figure 2 shows how the set-aside mechanism alleviates double counting and preserves the environmental integrity of the program.

[11] Key existing programs that include allowance set-aside provisions: the Conservation and Renewable Energy Reserve in Phase I implementation of Title IV of the Clean Air Act Amendments of 1990; and the NO_x Budget Trading Program, seven states have created or started the process to establish set-asides in this program.

Figure 2: The Set-Aside Mechanism Solving the Double Counting Problem



From the perspective of the cap, the impact of the project is counted just once, by setting aside allowances for energy efficiency and renewable energy instead of distributing them to capped entities. The GHG reduction credits associated with the project, however, change hands twice: first, from the set-aside pool to the project developer; second, from the project developer to the

capped entity. Figure 2 shows how the set-aside mechanism alleviates double counting and preserves the environmental integrity of the program.

The EE/RE set-aside would share key features with a direct offset mechanism. That is, as both follow the baseline and credit approach, an EE/RE set-aside credit would be earned in the same manner as offset credits. Both types of credits have the same credibility threshold to pass: their GHG reduction benefit must equal the GHG emission liability for which it will balance. The difference between the two is that the end result of an indirect energy efficiency project would be access to an allowance set-aside pool, whereas a direct emission reduction project associated with an non-capped source would yield an offset.

3. Creating an EE/RE Set-Aside Under Cap and Trade Complements Existing Policies and Programs

This section provides information on the benefits associated with creating an allowance set-aside pool for EE/RE projects, and discusses how this mechanism under a GHG cap and trade program would complement existing regulatory-based initiatives. The objective is to show why EE/RE projects should have access to the carbon market, in addition to participating in non-market based programs.

Under the GHG reduction programs taking shape in California and regionally, local governments will play a key role. In response to the sweeping demands and heightened expectations government entities are embarking on a fundamental re-examination of many of the planning and policy assumptions that have driven our economy for decades. For example, the areas in which the California Air Resources Board anticipates reductions from local government include community energy, community waste and recycling, community water and wastewater systems, community transportation, and community design, among others. This means a re-examination of everything from garbage contracts to water conveyance to public transportation to building codes to permitting and inspections. With regard to energy, local governments will play a key role in the development of, among other things, local renewable energy permits for solar rooftop efforts, as well as conditions associated with traditional energy resources that require permits for transmission, which ultimately leads to a viable and integrated energy system. It will require an examination by local government of both internal operations and the day-to-day activities of residents and businesses. Energy use is implicit in all of these areas. Permitting access and recognition in the emerging carbon market for electricity saving and clean energy projects is essential to support programs that reflect new and innovative policies and objectives.

Through existing funding mechanisms, local government programs have successfully delivered hard savings to meet state-wide and regional energy efficiency targets:

- Between 2004 and 2005, the Ventura County Regional Energy Alliance (VCREA) provided hard savings through tailored incentives directed to public agencies and based

on real measurable energy savings — the result was both energy saving of more than 3.1 million kWh and educational value to invest in energy efficiency.

- Oakland's 2002-2003 Energy Partnership program resulted in 13,053,000 kWh avoided, 2,069 kW of demand reduction, and $1,556,000 per year of energy savings. Los Angeles County's savings for 2002-2003 were 6,000,000 kWh and 1,245 kW of demand reduction.
- For the 2004-2005 program, the LA County program saved 6,400,000 kWh, reduced demand by 385 kW, and saved 676,300 therms. Higher savings were achieved for the 2006-2008 program, which saved about 14,000,000 kWh and over 740,000 therms.

These examples correspond with programs in which local governments have participated in energy efficiency programs with California investor-owned utilities (IOU).[12]

However, new responsibilities and demands on local governments to create GHG reductions – as envisioned by CARB, for instance – require additional funding sources and support mechanisms to meet new energy and pollution goals. Local governments can use a variety of revenue sources to underwrite energy efficiency and renewable energy projects that reduce GHG emissions. In addition to the IOU programs in California and other states, under the American Reinvestment and Recovery Act of 2009 ("ARRA"), local governments have the opportunity to receive support for projects undertaken over the next 24 months.[13] Furthermore, if the carbon market is open to GHG reduction "credits" from EE/RE projects then local governments could take advantage of another policy tool to help meet the GHG reductions asked of them. All the EE/RE support programs, implemented to complement each other, would become part of a local government's larger sustainability strategy.

Local government sustainability programs produce significant energy savings. The initiatives comprise municipal facilities and constituent buildings and homes within their jurisdiction. Local governments administer and implement projects using a combination of resources including utility programs, funded by ratepayers through a public goods charge. However, the utility programs restrict the types of valuable activities and projects that can be undertaken by local governments. Additionally, the utility programs provide insufficient funding to support the range of EE/RE initiatives local governments are eager to make happen. And CPUC funded programs are administered by the IOUs with significant overheads required for their administration; these overheads are typically around 15% of the program budget. The ability to access complementary funds through a set-aside mechanism in the carbon market represents a supplemental revenue stream to allow greater flexibility and enhanced results for local government sustainability programs.

[12] LGSEC refers to California's energy efficiency programs for illustrative purposes. Funding efforts such as the California Public Utilities Commission's (CPUC) Public Good Charge (PGC) and codes and standards development through the California Energy Commission (CEC), among other initiatives, have contributed to delivering significant energy savings over the years. LGSEC does not seek to access the carbon market at the expense of these successful programs.

[13] It is worth noting that one of the several criteria by which projects under ARRA will be evaluated is GHG reductions.

In addition to state-sponsored programs, some local governments elect to contribute from their general fund or other sources to promote energy efficiency programs, or to exceed State building efficiency codes. At the same time, many local governments are installing distributed renewable energy systems on municipal facilities, or creating programs that create incentives for local property owners to do so. Allowing energy efficiency and distributed renewable energy projects to create GHG reductions for trading in a carbon market would not take away the benefits these programs convey to all electricity consumers. Rather, energy efficiency and distributed renewable energy project developers, such as local governments, that turn to the carbon market for funding would seize energy saving opportunities missed by the regulatory initiatives.

LGSEC underscores that funding from the carbon market would produce additional energy saving and clean energy activities. That is, in conjunction with other funding programs (federal, utility/State), trading GHG reduction "credits" associated with local government EE/RE projects in the carbon market would provide incremental resources above and beyond what would have otherwise occurred. LGSEC is happy to work with policymakers to create rules that avoid layering GHG reduction credits on top of utility/State- and federally-funded programs. However, for programs outside of these initiatives, local governments should have access the carbon market.[14]

Finally, local governments are prime candidates to steward energy efficiency and renewable energy resources, and should be allowed to use private carbon market funding. In many instances local governments are the first place where problems from energy use and production are identified and solutions developed. Local governments have a history of acting as "first responders" to the community's changing views and conscience regarding pollution control, and therefore take a broad view of energy within the context of smart growth, transportation, and related topics. Correspondingly, since the purpose of cap and trade is to create a system that encourages and rewards GHG reduction activities, excluding local government energy efficiency and distributed renewable energy projects misses a significant segment of potential carbon market participants, which in turn limits the program's effectiveness. Local governments are in the best position to identify and implement energy efficiency and distributed renewable energy programs that align community values with state, regional, and national policy objectives.

[14] LGSEC recognizes that co-funding EE/RE projects could exist. Solutions to potential issues of crediting co-funded projects are available; one option could be to award GHG reduction credits in proportion to the amount of carbon market funding relative to all funding streams.

Appendix A: Resources on Energy Efficiency Project Measurement and Verification

Established criteria that apply to all baseline-and-credit GHG reduction projects, either direct or indirect, are used to evaluate their viability as legitimate substitutes for allowances held by capped entities. The basis for demonstrating that GHG reduction credits are equivalent to allowances and do not undermine the environmental integrity of the cap and trade program is achieved by showing that they are real, permanent, verifiable, and additional beyond those that would otherwise occur under business as usual circumstances.

Descriptions of the key evaluation criteria are as follows:

- **Real:** reductions represent an actual, measurable decrease in GHG emissions.
- **Additional:** reductions represent a decrease in GHG emissions incremental to what would have happened without incentives from the carbon market – beyond business as usual.
- **Verifiable:** a confirmation from a qualified, independent reviewer that the GHG reductions are real and additional.
- **Permanent:** the GHG reductions are not reversible, or if they are (as may be the case with carbon capture and storage or forestry), reversals should be accounted for and compensated appropriately.

Determining if the GHG reductions associated with EE/RE projects satisfy the criteria is not new ground. In fact, the energy efficiency community has deep, informed experience designing, implementing, quantifying, and monitoring project energy savings. Well developed methods to evaluate, measure, and verify project performance exist to establish that the GHG reductions meet the that meet the high-quality standards within cap and trade programs. Two good resources that provide detailed procedures to assess project impact include 1) the International Performance Measurement and Verification Protocol (IPMVP) and 2) the California Energy Efficiency Evaluation Protocols.[15]

Key components of the California protocols, particularly relevant to the determining energy savings and thus GHG reductions, include:

- **Impact Evaluation Protocol:** Includes methods to measure and document energy saving impacts achieved as a result of implementing energy efficiency programs and program portfolios. The impact evaluations estimate net changes in electricity usage, electricity demand, therm usage and/or behavioral impacts that are expected to produce changes in energy use and demand.
- **Measurement and Verification (M&V) Protocol:** Prescribe how conduct field measurements and data collection to support impact evaluations, among other topics.

Additionally, the WRI/WBCSD *Guidelines for Grid-Connected Electricity Projects* provides detailed guidance on how to account for greenhouse gas emission reductions created by projects that displace or avoid power generation on electricity grids. This document is particularly useful to identify methods to translate the kWh reduction into conservative reductions of GHG emissions from the grid – see www.ghgprotocol.org.

[15] http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/EM+and+V