SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

White Paper:

SoCal Climate Solutions Exchange

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EXECUTIVE SUMMARY

At the February 2008 Governing Board meeting, the Board approved development of the SoCal Climate Solutions Exchange, one of AQMD Governing Board Chairman Dr. Burke's initiatives for 2008. The Board requested a two-step process. The first step is discussion of initial recommendations described in this White Paper and presented at the June 2008 meeting of the Governing Board. At that meeting, the Board will provide direction to staff regarding whether rule development should proceed, which is the second step of the process.

The objectives of the SoCal Climate Solutions Exchange are to provide high quality greenhouse gas emission reductions that enhance the local economy and capture needed co-benefits for Southern California as businesses achieve voluntary, early reductions of greenhouse gases. This White Paper includes brief background information on climate change and how the SoCal Climate Solutions Exchange can assist in providing a mechanism to recognize and quantify voluntary early reductions. A local program operated by AQMD can ensure that reductions are real, additional (surplus), quantifiable, verifiable, permanent over a specific time, and enforceable. This will be of great value to facilities that need offsets for CEQA or other environmental mitigation, and may be of use for early compliance with future AB 32 requirements.

Many greenhouse gas reduction strategies also have co-benefits of reducing toxic and criteria pollutants, which will further accelerate clean air objectives in Southern California. This can be especially beneficial in environmental justice areas when such strategies are implemented there.

This White Paper provides suggested design principles, describes the public and agency process thus far, and describes staff's initial recommendations for the SoCal Climate Solutions Exchange and a greenhouse gas Air Quality Investment Program (AQIP). Both of these elements would include incentives to locate projects in environmental justice areas.

The SoCal Climate Solutions Exchange would be a voluntary program where facilities in the District could undertake projects to voluntarily reduce greenhouse gas emissions in advance of any regulatory requirement. These projects would follow pre-approved protocols developed by CARB, the California Climate Action Registry (CCAR), or AQMD staff. It is staff's intention to work closely with these other agencies to develop as many protocols as possible to encourage voluntary early actions and to be able to have those reductions quantified. AQMD staff will submit for Governing Board approval all protocols to be used for the SoCal Climate Solutions Exchange.

Staff's initial concepts are that any project in the District could generate reductions per an approved protocol, and there would not be any restrictions on how those reductions could be purchased or used. AQMD staff would act as verifiers for the reductions and the SoCal Climate Solutions Exchange would include a mechanism for certification, registration, and tracking of the reductions.

An AQIP would enable the AQMD staff to collect funds from parties that need certified emission reductions, pool those funds, and use them to reduce greenhouse gases. These projects would also follow the pre-approved protocols.

The White Paper includes a description of staff's recommendations for the SoCal Climate Solutions Exchange. These include the scope of the Exchange, generation and potential use of certified reductions, ownership, additionality, the AQIP, incentives for Environmental Justice areas, recommendations related to running the Exchange, protocols, verification, and oversight.

Appendices include information on international, national, regional, state, and local climate change programs, a discussion of other voluntary greenhouse gas trading programs, a description of how surplus reductions are determined in other programs, key stakeholder comments, and information on what protocols are in existence, are under development, or have potential for development and use. The last appendix, Appendix F, lists acronyms used in this document.

The following table summarizes the main components of staff's initial recommendations for the SoCal Climate Solutions Exchange. These recommendations are more fully described elsewhere in this White Paper. Each of these recommendations would need to be further explored and refined during rule development.

Table EX-1
Summary of Initial Staff Recommendations

Topic Area	Description
Objectives	To provide more certain, high quality greenhouse emission reductions in the District, which will benefit local businesses generating and needing greenhouse gas reductions. Retain local co-benefits of greenhouse gas reduction projects, especially for Environmental Justice areas.
Geographic Scope	Facilities in the District regardless of whether they have AQMD permits, and other projects in the District could generate reductions based on pre-approved protocols.
Generation of Reductions	Reductions must be real, additional, quantifiable, verifiable, and permanent over a specified time period, and enforceable. Follow Board-approved protocols.
Ownership of Reductions	Project proponent or designee, subsequent trades through registration. Certified reductions for portion of project paid by public funding only if specifically authorized by the agency approving the funding. No co-benefits unless specifically authorized.
Potential Use of Reductions Potential Use of Reductions (cont.)	No restrictions on purchase or use. Likely to be used for CEQA or other mitigation. Could be used by individuals or organizations, etc. that want to mitigate their carbon footprint. Potential use in California's future regulatory programs to be determined. Potential use in regional, national, or international programs to be

	determined.
Banking	No need for contemporaneous generation and use. Banking may be appropriate.
Additionality	Option 1 – projects implemented X years prior to mandatory compliance generate reductions until compliance date. Option 2 – certified reductions sunset X months prior to mandatory compliance date. Additional discussion during rulemaking to be consistent with CARB policy.
Greenhouse Gas AQIP	Pooling of funds by AQMD to implement reduction projects, option for facilities that need reductions.
Incentives for Environmental Justice Areas	Define based on updated MATES III information. Direct AQIP projects to these areas. Other incentives to be evaluated further.
Protocols	Cooperative effort with CARB, California Climate Action Registry (CCAR), California Air Pollution Control Officers Association (CAPCOA). Air districts to help develop protocols. All will work together so protocols can be useful for multiple programs.
Verification	AQMD staff would verify reductions.
Exchange	AQMD to issue, record, and register certified reductions. Different models described with varying levels of AQMD involvement with respect to handling trades. Needs further evaluation.
Oversight	Public review for quantification, certification, and registration. Periodic performance audit.

INTRODUCTION

This White Paper describes staff's initial recommendations for the development of the SoCal Climate Solutions Exchange. The Governing Board Climate Change Committee and a Technical Advisory Group have provided input to the recommendations contained herein and helped shape staff's initial framing of the Exchange. At the June 2008 Governing Board meeting, these recommendations will be discussed, and the Governing Board will provide direction to staff on whether to proceed with rule development. Staff will continue to work with all stakeholders to further refine the proposal, if rule development ensues.

BACKGROUND

As climate change impacts are becoming better understood, more attention has been focused on reducing carbon dioxide and other greenhouse gases from actions by individuals, businesses, cities, and levels of government ranging from cities to counties to nations.

There are many companies offering greenhouse gas offsets for sale, but there is uncertainty involved with many of the projects, and it is sometimes difficult to judge whether the offsets are real. In 2007, the Financial Times investigated many of the existing and emerging greenhouse gas offset markets, and concluded *"A Financial Times investigation has uncovered widespread failings in the new markets for greenhouse gases…The FT investigation found: widespread instances of…worthless credits that do not yield any reductions in carbon emissions…a shortage of verification, making it difficult for buyers to assess the true value of carbon credits…"*.

Because companies in Southern California have voluntarily been reducing their carbon impacts or have been required to reduce their carbon impacts, there is a pressing need for real, high quality reductions that can be relied on. To address this issue, Chairman Burke introduced the SoCal Climate Solutions Exchange at the January 2008 Governing Board meeting as one of the Chair's initiatives for 2008. At the February 2008 Governing Board meeting, the Board approved development of initial recommendations in a two-step process. This White Paper represents the first step, which is a discussion of initial staff's initial recommendations by the Board. The second step, if approved by the Board at the June 2008 meeting, will be initiation of rule development.

In the last year, there are many examples where entities have purchased offsets to compensate for their carbon footprint. This is being done on an individual and company basis. Purchasing offsets can be voluntary or required, as part of the permitting process, as a result of a lawsuit, or in response to comments on California Environmental Quality Act (CEQA) documents or general plans. In many cases where a company cannot make adequate on-site changes to mitigate their carbon impacts, AQMD staff, and others throughout the state, are being asked what exchanges have credibility and how can someone ensure that the reductions they are purchasing are real?

In the CEQA arena, the Attorney General sued a northern California refinery for failure to conclude whether greenhouse gas emissions from a project were significant and for failure to mitigate those emissions. That refinery is paying the Bay Area AQMD $7 million to a carbon offset fund, which will be used to reduce greenhouse gases. A San Joaquin dairy expansion

project also received comments from the Attorney General regarding their CEQA document. The comments included a recommendation to consider additional on-site mitigation or purchasing offsets to mitigate increases in pollutants that contribute to climate change impacts.

The County of San Bernardino entered into a settlement agreement with the Attorney General for failure to analyze and mitigate greenhouse gas emissions in their General Plan. The settlement requires that County develop an inventory and reduction plan for Greenhouse gases. AQMD staff is assisting the County staff in their inventory development.

Recently, staff has analyzed, under CEQA, greenhouse gas emissions related to a Chevron project in the South Coast, and Chevron has agreed to pay the AQMD to mitigate greenhouse gas emissions that still result after on-site improvements. Many more projects are in the pipeline, and in the absence of CEQA thresholds, many project proponents will be required, or will choose, to obtain offsets as mitigation.

The staff at AQMD has decades of experience in issuing and certifying streams of emission reductions in the New Source Review (NSR) program, and also has extensive experience in the development and implementation of rules for generation of mobile and area source short-term credits (Table 1). Since 1994, AQMD staff has been implementing the Regional Clean Air Incentives Market (RECLAIM) which involves annual emission trading units and extensive tracking of trade activity. Experiences with these programs will help AQMD staff in the development and implementation of the SoCal Climate Solutions Exchange.

Background information is provided below to help set the context for why this initiative was introduced and how the SoCal Climate Solutions Exchange can become an important local program that will contribute to addressing a global problem, and help local businesses needing GHG reductions. AQMD involvement will provide confidence to emission reduction generators and subsequent users.

Climate Change

Global warming results from an imbalance in the amount of solar radiation that is absorbed by the Earth or reflected back into the atmosphere. When particles or gases in the atmosphere cause more solar radiation to reflect back to Earth, increased temperatures occur.

In 1988, the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) established the Intergovernmental Panel on Climate Change (IPCC), a scientific intergovernmental body to analyze climate change impacts. The IPCC *Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report, November 2007*, reports that the prevailing scientific view is that warming of the climate system is unequivocal. There are increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level. The IPCC also reports that global greenhouse gas emissions due to human activities have grown since pre-industrial times, with an increase of 70 percent between 1970 and 2004.

For California, impacts have been projected for a range of climate change scenarios in 2070 – 2099 in a California Energy Commission (CEC) report, *Our Changing Climate: Assessing the Risks to California (2006).* Business-as-usual is projected to result in 8 to 10.5 degrees

Fahrenheit increase, with 90 percent loss of Sierra snow pack, 22-30 inches sea level rise and 3-4 times the number of heat wave days. Even with the Governor's aggressive target of lowering California's greenhouse gas emissions to 80 percent below 1990 levels by the year 2050, projected increases of 3-5.5 degrees Fahrenheit are expected to reduce Sierra snow pack levels by 30-60 percent, bring about 6-14 inches of sea level rise, and result in 2-2.5 times the number of heat wave days.

Additional climate change impacts include health problems resulting from exacerbation of air pollution due to increased temperatures and more ozone and particulate formation, and increased infectious diseases. Water-related issues include more droughts and flash floods, and a decrease in potable water supply and quality. Decreases in food supply, increases in wildfires, and decreases in forest productivity are also expected to occur.

Climate change is a global problem, one that will require actions at all levels of government to resolve. There are many programs to reduce impacts of climate change at the international, national, regional, state, and local levels. These are described in Appendix A.

Voluntary Carbon Markets

There are voluntary carbon markets in the U.S. that have been, or are being, developed in response to efforts to reduce greenhouse gases. Voluntary markets allow individuals, businesses, and organizations to offset their carbon footprint through a variety of projects world wide.

The Chicago Climate Exchange (CCX) started in 2003 and has over 300 members. Members make a commitment to reducing greenhouse gases and are given allocations with a declining balance. Selling excess allocations or purchasing allocations to match emissions with the annual allocation are part of this cap-and-trade program. Qualifying offset projects can also generate reductions which are traded on the CCX. Such offsets can be produced world-wide, which makes verification more challenging.

There will be more exchanges developing as climate change regulations become more prevalent in the U.S. In California, the CCAR has announced the development of a registration and trading program for voluntary early reductions under AB 32, focusing on offsite reductions from sources that are less likely to be regulated. In 2006, CCX announced the formation of the New York Climate Exchange and the Northeast Climate Exchange, who will develop instruments for Regional Greenhouse Gas Initiative (RGGI) in 2009.

RGGI is an agreement that is signed by the Governors of 10 member states, including: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. The states agree to cap emissions from fossil-fuel fired electric generation plants larger than 25 MW at current levels for 2009. A cap-and-trade program is in place with a 10 percent decrease in greenhouse gas emissions by 2019.

Appendix B provides more information on European and other markets that are dealing with offsets for greenhouse gases.

SoCal Climate Solutions Exchange

The SoCal Climate Solutions Exchange is envisioned to help stimulate voluntary early actions for reducing greenhouse gases. Greenhouse gas emission reductions that rigorously follow approved protocols, and are certified and monitored by AQMD staff will provide confidence that emission reductions are real and will continue to be maintained over the life of the project. This will provide a valuable service for facilities needing CEQA mitigation now, and the certified reductions may have possible use with future AB 32 compliance. This will depend on regulations that CARB will develop.

OBJECTIVES

The objectives of the SoCal Climate Solutions Exchange are to provide high quality greenhouse gas emission reductions that enhance the local economy and capture needed co-benefits for Southern California as businesses that achieve voluntary, early reduction of greenhouse gases. The development of the protocols for quantification, and rules and procedures for certification of emission reductions, registration, trading and tracking of the certificates will ensure that any reductions in this program will meet the key criteria for any program of this nature:

- Real – the reductions actually occur;
- Additional – the reductions are not required by any regulation or would not have happened anyway;
- Quantifiable – the reductions can be measured using tools or tests that are reliable and give confidence;
- Verifiable – the action that resulted in reductions can be audited and there is sufficient evidence to show that the reduction occurred and was quantified correctly;
- Permanent – the reduction will be real and additional over a specified time period; and
- Enforceable – there is an enforceable mechanism in place to ensure that the action is implemented correctly, such as a contractual agreement with specific conditions and terms.

Any reductions must follow approved protocols so the quantification is of sufficient quality to ensure that the reductions are real and quantifiable. Certified reductions must also be additional. Additional is generally compared to regulatory requirements and common practices. A discussion of how surplus has been treated in other regulatory programs is included in Appendix C of this White Paper. This information is intended as background. An appropriate definition for additionality for the SoCal Climate Solutions Exchange will be developed as part of the rulemaking and its specific application to a source category will need to be determined in each protocol that is used to generate certified reductions.

Another important criterion is that any reductions be verifiable. AQMD staff would review projects, determine if the project properly followed the appropriate protocol, and the project was executed correctly. The certified reductions must be permanent, over a specified life time which relates to the additionality of the reductions. Any reductions must also be enforceable, through permit conditions, enforceable plans, or other mechanisms to help ensure the validity of the reduction.

The SoCal Climate Solutions Exchange is envisioned to facilitate local investments, and special provisions will be included to provide incentives in environmental justice areas. Current environmental justice areas, for the District, include areas where at least ten percent of the population is below the poverty level (based on year 2000 federal census data); and either 1) the cancer risk is greater than one-in-one thousand (as determined by the AQMD MATES II study using 1998 data); or 2) the PM10 exposure is greater than 46 ug/m^3 (as determined by AQMD monitoring data). The MATES III study and more recent air quality data will be used to update the cancer risk and PM2.5 exposure levels for the characterization of environmental justice areas.

Local businesses will have certainty that reductions will be of high quality, although the future need or use for these credits is yet to be determined by regulatory agencies authorizing or allowing such use. Short term needs, before CARB develops the regulatory structure and measures to implement AB 32, include the use of such certified reductions as offsets for CEQA or other mitigation.

Many greenhouse gas reduction strategies also have co-benefits of reductions of criteria or toxic pollutants. These can be especially helpful in environmental justice areas. Promoting voluntary, early reduction projects in the District can help accelerate other important clean air objectives.

DESIGN PRINCIPLES

The following design principles are suggested for development of the SoCal Climate Solutions Exchange:

1. *Program development will occur in an open public process.*
2. *Reductions will be real, quantifiable, verifiable, additional, enforceable, and permanent over a specified time period.*
3. *Incentives will be available to encourage reductions in environmental justice areas.*
4. *Program administration will be efficient, streamlined, timely, and without conflicts of interest.*
5. *Fees associated with the SoCal Climate Solutions Exchange will enable the program to be self-sustaining.*
6. *Information for the public and participants in the SoCal Climate Solutions Exchange will be transparent.*

Should rule development proceed, staff will work with stakeholders relative to these, and potentially other design principles in the development of the program.

PUBLIC PROCESS

The Governing Board established a Climate Change Committee, which met on March 20, 2008 and May 28, 2008 to work with staff on this initiative. In addition, Climate Change was extensively discussed at the Governing Board's April 17, 2008 retreat.

Staff has been working with a Technical Advisory Group comprised of representatives from CARB, CCAR, environmental and community groups, industry, academic institutions, and local government. This group has helped brainstorm initial concepts and provided valuable insight

and perspectives on key design elements. The input from this group has influenced staff's recommendations/concepts, which are reflected in this White Paper. This group has met four times, on March 19, 2008, April 2, 2008, April 23, 2008 and May 22, 2008. The meetings were open to the public, and other attendees also provided beneficial input. A list of the Technical Advisory Group members is provided in Table 1.

Table 1
Technical Advisory Group Members

ORGANIZATION	MEMBER	ALTERNATE(S)
California Air Resources Board	Richard Bode	Edie Chang
California Climate Action Registry	Gary Gero	Joel Levin
California Council for Environmental & Economic Balance	Bill Quinn	
California Portland Cement	Jay Grady	Scott Isaacson Steve Regis
City of Los Angeles	Dee Allen	Gretchen Hardison
Communities for a Better Environment	Jesus Torrez	
County of San Bernardino	Julie Rynerson Rock	Doug Feremenga
Department of Water & Power	Bruce Moore	
Environmental Defense Fund	Janea Scott	
Los Angeles County Sanitation District	Greg Adams	
Natural Resources Defense Council	Adrian Martinez	
South Bay Council of Governments	Jacki Bacharach	Barbara Dye
Southern California Edison	Howard Gollay	
Southern California Gas Company	Lee Wallace	
Western States Petroleum Association	Catherine Reheis-Boyd	Michael Wang Michaeleen Mason
University of California, Los Angeles	Matthew Kahn	

Appendix D summarizes key stakeholder comments received in Technical Advisory Group meetings. If rule development proceeds, staff will continue to work with all stakeholders to develop draft rules for the program.

AGENCY COORDINATION

CARB staff has indicated that the SoCal Climate Solutions Exchange could help stimulate voluntary early reductions, which they strongly encourage. Staffs from AQMD, CARB and CCAR have all committed to work together on protocol development for the SoCal Climate Solutions Exchange. This will include the program design and protocols.

In addition, other air districts in California, through the California Air Pollution Control Officers Association (CAPCOA), have participated in an initial discussion with CARB and CCAR regarding how to best coordinate drafting protocols. CAPCOA, CARB and CCAR staffs evaluated the protocols that are planned for development, added suggestions for others that would be beneficial and determined which air district or agency is best suited for developing specific protocols. This will maximize resources and avoid potential duplicative efforts. Protocols will need input by the other agencies, as well as the public, and are intended to be approved for use by AQMD, other air districts, CARB and CCAR. A larger selection of

approved protocols will be helpful for facilities and for each of these agencies. As additional suggestions are made for other protocols, CARB, CCAR, and CAPCOA or AQMD will determine which agency or district should evaluate the proposal for potential protocol development. Appendix E includes information about existing protocols and planned protocol development.

INITIAL RECOMMENDATIONS

The following sections describe staff's initial recommendations for the SoCal Climate Solutions Exchange. These ideas would need to be further evaluated and many details worked out for developing the program, the rules, administrative procedures, and tracking mechanisms.

Geographic Scope of Program

Projects to generate certified reductions for the SoCal Climate Solutions Exchange would be from within the District. Comments from the Technical Advisory group were that projects outside the District should be included because that would expand the opportunity for reductions and that more cost-effective reductions could be obtained. Since the objectives of this initiative are to encourage local projects that would benefit the economy and the environment, due to co-benefits often realized with greenhouse gas reductions, staff does not support this suggestion. In addition, the ability of AQMD staff to ensure that reductions occur and continue to occur would be hampered for projects that are outside the District. One exception might be joint agreements/programs with other California air districts.

Generation of Certified Reductions

Any project in the District would potentially be eligible to generate greenhouse gas reductions through an approved protocol. It should not matter whether the facility or operation has a permit with AQMD, provided adequate records exist to establish a baseline, quantify reductions and ensure that the reductions are valid over a specified period of time.

Facilities with AQMD permits (traditional or Title V) may also generate certified reductions. In some cases, changes to the permits may be required to ensure that reductions can be monitored and are enforceable. Staff will work closely with stakeholders and U.S. EPA staff to try to minimize administrative requirements and streamline the process, especially for Title V facilities. These larger facilities may have more opportunity for greenhouse gas reductions and an unduly burdensome process may reduce their incentive to achieve early reductions.

Ownership

It is very important that ownership of reductions is clearly established to avoid misunderstandings concerning which party would receive certified reductions as a result of implementing a project.

An issue raised during the discussion of ownership was the potential for double counting toward regulatory obligations and the need to avoid issuing certified reductions for actions that are already considered as part of the reductions relied on in the AB 32 Scoping Plan. For example, a clear mechanism needs to be in place if there are local government reduction targets and a facility within that local government's jurisdiction makes a voluntary reduction. In that case, if the voluntary reduction resulted in certified reductions that could then be used by another entity

in California, there could be a net loss towards the AB 32 reductions. This is an issue that CARB will need to provide guidance on. Accounting procedures will need to be developed to avoid potential multiple use of certified reductions.

Staff recommends that ownership of certified reductions be to the project proponent, or their designee, with subsequent ownership determined by trades that are registered appropriately. Projects resulting in reductions of greenhouse gases that also have co-benefits of reductions of criteria pollutants or air toxics would not be owned by the project proponent unless they were specifically authorized. Staff's initial recommendation for reductions that are partially funded by public funding is that the portion of the project paid by public funding would be eligible for generating certified reductions only if specifically authorized by the agency approving the funding. More discussion is needed during rule development to ensure that there would not be any double counting of reductions towards AB 32 planning assumptions or compliance obligations.

Potential Use of Reductions

Once certified reductions are registered in the SoCal Climate Solutions Exchange, staff envisions that any party could purchase them. In addition to a facility banking reductions for its own use, for example as future CEQA mitigation, other facilities and other parties may want to purchase them.

There are many greenhouse gas reduction programs that allow the use of a limited number of offsets created outside the program itself. It is possible that some of these programs might authorize the use of SoCal Climate Solutions Exchange certified reductions as offsets available for use in their program.

Another potential use is by individuals, companies, or other entities that want to voluntarily mitigate their carbon impacts. Certified reductions in the SoCal Climate Solutions Exchange might be an avenue for them to reduce their carbon footprint with locally generated reductions certified by AQMD.

Stakeholders had many questions about what AB 32 would require of facilities and local governments, and how certified reductions under the SoCal Climate Solutions Exchange might be used to meet future AB 32 requirements. CARB staff is currently developing the state's AB 32 Scoping Plan. A draft will be released for public review at the end of June, although CARB staff has stated that all the analysis will not be completed at that time. A supplement will be available in late July and a revised draft in October, in preparation for the Board adoption hearing, which is scheduled for November 2008. The requirements and potential use of any voluntary early reductions or what mandatory requirements will be required remains to be determined. However, CARB staff is participating actively with AQMD, and is supportive of the concept of having the SoCal Climate Solutions exchange to help encourage early, voluntary greenhouse gas reductions.

Banking

Greenhouse gases have very long atmospheric lifetimes (CO_2, for example, has a half life of 100 years). When setting up a reduction generation and use program, it is very different than a traditional criteria pollutant program, where contemporaneous reductions and use are needed to

help meet daily or hourly emission standards. For greenhouse gases, it would generally be appropriate to allow banking. This will add more incentive for early actions and provide flexibility for parties needing reductions. The extent of banking would be explored as part of the rulemaking process for the SoCal Climate Solutions Exchange and also could be determined for other existing or future regulatory programs.

Additionality

The Technical Advisory Group discussed different ways that additionality could be defined, and there were a range of viewpoints. In AB 32, additionality, for the purpose of market-based compliance mechanisms, is that the reduction is in addition to any greenhouse gas emission reduction otherwise required by law or regulation, or that would have occurred otherwise. These two elements are common in greenhouse gas programs. In some cases, the Kyoto protocol requires that additionality also include a financial component. To meet this criterion, the determination must be made that the project would not have occurred unless some of the costs could be recovered due to offset sales. Adding a financial component needs to be done carefully, to avoid any unintended deterrent for projects.

For the purpose of discussion with the Technical Advisory Group, staff initially recommended that if reductions occur one year before the effective date of any existing or future greenhouse gas requirement, then the reductions would be considered additional. Many members thought that approach was too stringent.

In a subsequent meeting, staff presented two options of potential approaches for addressing additionality. Option 1 would allow a project implemented at least a specified amount of time before a rule requirement to qualify for certified emission reductions per an approved protocol. Once the project qualifies, reductions could be generated until the rule compliance date. Option 2 would consider reductions as additional without a requirement for when a project needs to be implemented. "Additionality" would cease at a specified time prior to rule implementation. The length of time would need to be determined.

Staff recommends that the definition of additionality for the SoCal Climate Solutions Exchange be uniform, although the application may vary depending on the source category. Staff also recommends additional discussion during rulemaking to further explore approaches and to make sure the definition of additional for the SoCal Climate Solutions Exchange is consistent with CARB policy that will be developed regarding additionality.

Greenhouse Gas Air Quality Investment Program (AQIP)

Some facilities that need greenhouse gas reductions may not have the opportunity to make changes at their facility. A greenhouse gas AQIP is proposed so staff could accept funds in such an instance and secure reduction projects to fulfill that need. Other parties may also contribute to the AQIP. By pooling funds, staff may be able to fund larger projects that individual facilities could not take advantage of. The same protocols that facilities would follow would govern the reductions for the AQIP. AQMD staff would quantify and certify reductions.

Initial use of the greenhouse gas AQIP would be limited to parties that are required to have greenhouse gas reductions by AQMD, or those parties that need CEQA mitigation as recommended by lead agencies within the District. The use of the AQIP could be expanded once

sufficient experience is gained in the generation of the reductions and the management of the program.

The Technical Advisory Group commented that the AQIP should follow the same protocols as other projects, which staff agrees with. Concern was also expressed that the AQIP could compete for projects that might otherwise be available to businesses.

Incentives for Environmental Justice Areas

Environmental justice areas, as currently defined for the District, include areas where at least ten percent of the population is below the poverty level (based on year 2000 federal census data); and either 1) the cancer risk is greater than one-in-one thousand (1,000 in-a-million) or 2) the PM10 exposure is greater than 46 ug/m^3. Currently, the cancer risk is based on MATES II data and the PM10 exposure is determined by AQMD monitoring data.

The District is completing the MATES III project, and the data from that study will be used to update the environmental justice criteria.

Environmental justice areas would benefit from many of the types of projects that could be employed to reduce greenhouse gases, as there are often co-benefits of reduced diesel or criteria pollutant emissions.

Staff will keep environmental justice concerns in mind in the development and implementation of the SoCal Climate Solutions Exchange. The SoCal Climate Solutions Exchange and the use of AQIP funding would be designed to give priority or incentives to projects in environmental justice areas. Funding will be directed to projects in environmental justice areas to the extent possible to take advantage of the likely pollutant co-benefits in areas that have higher criteria or toxic pollutant exposures. Other incentives would be evaluated during rule development.

Protocols

One of the most important elements of any type of certified reduction program is the technical soundness of the underlying quantification methods, or protocols. A protocol is used to determine the starting point, or baseline from which reductions can be measured. A protocol spells out how to measure the baseline, what actions can be taken to generate reductions, and how those reductions are to be calculated and subsequently verified.

Protocols would only be developed for reductions that meet the test of additionality. Each protocol would include the length of time that reductions could be generated in order to ensure that the reductions are additional and also represent a reasonable estimate of the length of time the action is expected to continue to generate benefits. For example, reductions to generate mobile source credits are often limited to a specific number of years that will reflect the expected lifetime of the equipment replaced or put into service. The reductions may also be limited to when new vehicle standards will be effective, to ensure that the reductions are surplus.

The Technical Advisory Group expressed an interest in developing protocols that would not be limited to mass reductions, but should be flexible enough to give reductions for energy efficiency and other projects.

Appendix E includes a list of what protocols the CARB and CCAR have already approved, which protocols are currently under development, and a list of other protocols that may be beneficial for the SoCal Climate Solutions Exchange participants.

Criteria

For the AQMD staff to recommend approval of an existing or new protocol, the following criteria would need to be met:

1. *The protocol should be written clearly, be easy to understand, and have consistent, repeatable results.*
2. *Reductions resulting from application of the protocol must be real, additional, quantifiable, verifiable, and permanent over a specific period of time.*
3. *The protocol must specify the year or years used for the baseline, quantification of the reductions, and the length of time that the reductions will be considered additional.*
4. *The emission factors or test data used to substantiate baselines and reductions must be of high quality. Parameters used to derive reductions should be verifiable via lab tests, source tests, vendor guarantees, or other solid quantification methods.*

Approval Process

Any protocol to be used in the SoCal Climate Solutions Exchange would go before the Governing Board for approval. Staff will review existing protocols that have already gone through technical review, a public process, and have been approved by either the CARB or CCAR. These can be brought to the Governing Board for review and approval in a timely manner and would then be available for use by facilities or other parties in the District. Consistency in the protocols used by AQMD, CARB, and CCAR to generate early reductions is very important to all parties.

There are a number of protocols that are currently being developed. AQMD staff will participate in those efforts and bring those that are appropriate for use in the SoCal Climate Solutions Exchange to the Governing Board for approval, as well. The CARB, CCAR and AQMD staff will work together to prioritize the 'wish list' of protocols and will designate which agency has the resources and expertise to develop specific protocols. The three agency staffs will work closely together to make sure that protocols will meet the criteria and needs of each agency. This will maximize resources and help achieve a more robust selection of reduction opportunities.

Verification of Reductions

Staff at AQMD would be responsible for the verification of reductions under approved protocols. The verification would include analysis of whether the base year and reductions are appropriately calculated per the protocol methodology, and whether the reductions calculated are accurate. Verification would also include site visits, review of records, audits for each year's reductions, and management oversight.

Exchange

Reduction Certificates

After verification by staff and management, a reduction certificate would be issued and registered in the SoCal Climate Solutions Exchange.

Units

To be consistent with other programs, the unit for reductions would represent a metric ton of carbon dioxide equivalents. Each unit would be issued a unique serial number that would include identifying information such as the year the reduction occurred.

Issuance

The Technical Advisory Group discussed whether certified reductions could be issued prospectively for a specified number of years, based on expected activity and determination of additionality, or retrospectively, based on activity each year and continued additionality. For CEQA it would be beneficial to have a stream of certified reductions which could be enforceable through permit conditions. The Chicago Climate Exchange operates a cap-and-trade program with allocations that decline over time for participating facilities. Allocations are issued and can be traded for future years, but offsets used to reconcile emissions with allocations are only issued retrospectively.

Existing protocols for greenhouse gas reductions rely on a post-quantification process to provide more certainty. Once a project is implemented, the amount of reductions depends on the activity each year. At the end of a compliance period, the reductions are quantified and verified before reductions, such as offsets, are granted. For the SoCal Climate Solutions Exchange, AQMD staff would issue most certified reduction certificates after an action occurred, such as on an annual basis. Reductions would be issued for a specific year in which the reductions occurred, but would likely be able to be used (banked) over a longer time period. However, there may be situations that involve an AQMD permit where prospective certification might be appropriate for a specific number of years that an action would be deemed additional. Staff recommends that this be further explored during protocol development, and implemented when feasible.

Two Models for AQMD's Role in Trading

Two models were discussed with the Technical Advisory Group related to what services AQMD could provide in the SoCal Climate Solutions Exchange with respect to how certified reductions are verified, issued, registered, and traded. In each model, AQMD would verify and certify reductions, but there are differences in the level of customer service provided relative to trading.

Model 1 would have AQMD offering an information registry of what reductions have been verified and certified by AQMD staff. In this model, AQMD could be responsible for tracking trades, but not be involved in the actual trading transactions. An electronic system would need to be developed to track transfers of reductions between parties. Model 2 varies by including AQMD as providing the trading mechanism and matching potential buyers and sellers. An electronic system with public access would allow potential buyers and sellers to know what is available. Staff recommends that these options, and others, be further refined during rule development.

Program Review

There are several functions involved with a program such as the SoCal Climate Solutions Exchange and the AQIP, for which quality assurance/quality control analysis is appropriate to further ensure mutual trust in the program.

Staff is recommending a public process for protocol approval, and consultant review for quantification, certification, and registration. Protocols developed by AQMD would have stakeholder input during development and would be reviewed and approved by the AQMD Board at a Governing Board meeting. Some protocols that have already been approved by CCAR or by the CARB Board or Executive Officer may have already undergone public input and review. For use in the SoCal Climate Solutions Exchange, staff recommends that these protocols be reviewed and approved by the AQMD Board at a public meeting, as well.

Staff also recommends that the SoCal Climate Solutions Exchange have periodic performance audits conducted by an auditing firm. The audit could include all aspects of the program, including evaluation of whether protocols were appropriately applied and emission calculations were correct, whether the documentation of certified reductions is adequate, and could include a review of all the administrative aspects of the SoCal Climate Solutions Exchange to ensure appropriate program management.

If the Governing Board adopts rules to implement the SoCal Climate Solutions Exchange, frequent reviews would be recommended to make sure that the program is meeting its objectives. Staff would bring regular reports to the Climate Change Committee during rule development. Once the program is initiated, quarterly reports to the Climate Change Committee, and an annual report to the Governing Board are recommended.

MOVING FORWARD

At the June 6, 2008 Governing Board meeting, staff will summarize the efforts to date on the conceptual development of the SoCal Climate Solutions Exchange and recommend that rule development be initiated. The objectives, public process, initial recommendations, and stakeholder viewpoints will be discussed.

The Board will hear public testimony and is expected to provide direction to staff on whether or not rule development should proceed. If the Board direction is to develop rules to implement the program, then staff will draft rules for the Board's consideration at its September or October meeting. The public process will include continued discussions with the Technical Advisory Group, working with the Board Climate Change Committee, other AQMD committees, and public workshops. Appropriate CEQA and socioeconomic assessments will be conducted as part of the rule development process.

APPENDIX A
EFFORTS AT THE INTERNATIONAL, FEDERAL, REGIONAL, STATE, AND LOCAL LEVEL

International

In 1988, IPCC was formed to bring together scientific experts to evaluate the risks of climate change. The IPCC has published four technical reports which have helped inform climate change policy. The First Assessment Report, 1990 includes three volumes - Scientific Assessment of Climate Change, Impacts Assessment of Climate Change, and the IPCC Response Strategies. The Second and Third Assessment Reports, Climate Change 1995, and Climate Change 2001, addressed the science of climate change, impacts, adaptation, and mitigation. The Fourth Assessment Report, 2007, updated information on these topics and addressed the vulnerability of different systems to climate change. These systems include food supply, infectious diseases, increased ozone, changes to drought and flood patterns, as well as changes to snow pack and sea level.

The IPCC has also prepared a number of special reports on aviation, regional impacts of climate change, technology transfer, emissions scenarios, land use, land use change and forestry, carbon dioxide capture and storage and on the relationship between safeguarding the ozone layer and the global climate system.

The United Nations Framework Convention on Climate Change (UNFCCC) was formed in 1992. This was a United Nations effort that ultimately resulted in the ratification of the Kyoto protocol in 1997. The Kyoto Protocol is an international, legally binding agreement to reduce greenhouse gas emissions. It became effective in 2005. Each country has a specific target of at least 5 percent reduction from 1990 levels, to be achieved between 2008 and 2012. The United States is not one of the participating countries. Appendix D describes the trading mechanisms available for participating countries.

The International Council for Local Environmental Initiative, ICLEI, was formed in 1990 to promote sustainable development for local government, regional, and national members. There are currently over 800 members.

International discussions continue, with a December 2007 meeting in Bali culminating in a 'roadmap' for negotiations, which continued in Bangkok in March 2008.

Federal

The United States (U.S.) is not one of the countries that have signed the Kyoto protocol. The President Bush's U.S. Global Climate Change Policy, 2007, (published by the U.S. Department of State) sets a framework for energy security and climate change. It highlights energy efficiency and research efforts that the U.S. has initiated to reduce greenhouse gases. Congress is debating several bills that may result in a cap-and-trade or other programs for reducing greenhouse gases for this country. The President announced new climate change goals in April 2008. These goals emphasize technology advancement and slowing of growth by the year 2025.

The Climate Registry (TCR) was formed in March 2007. This non-profit organization was founded by the participating states, tribes and provinces and serves as a voluntary greenhouse

gas emission inventory registry. In recent correspondence to CCAR members, TCR has indicated that it will be superseding the CCAR inventory function. The goal of TCR is to promote the use of best practices in inventory and a common data format for entities reporting greenhouse gases. Members include 39 U.S. states and the District of Columbia, 7 Canadian provinces, 3 Indian tribes, and 6 Mexican states. California is one of the members.

EPA published a national greenhouse gas inventory in April 2008 (430-R-08-005), and is working on draft mandatory reporting rules, which are due in September for public comment. Final rules are due in June 2009.

Regional

In December 2005, the Regional Greenhouse Gas Initiative (RGGI) was formed as a cooperative effort involving 7 northeast and mid-Atlantic states, originally, and now covering 9 states. RGGI states have developed a regulatory strategy, which focuses on a cap-and-trade system, to reduce greenhouse gas emissions. Large electric generating units will reduce emissions, overall, to ten percent less than 2009 levels by 2018. The compliance period for reconciling allocations to emissions is 3 years.

The Western Climate Initiative (WCI) sets a regional reduction goal for several western states, including California, as well as 2 Canadian provinces. This is an agreement by Governors, who set an overall regional target in spring 2007. Rules for a multi-sector market-based program will be developed by August 2008. Each participant sets short-, medium- and long-term reduction goals for 2010–2012, 2020, and 2040-2050, respectively. Collectively, greenhouse gas emissions are expected to be fifteen percent less than 2005 levels by the year 2020.

Regional efforts also include the U.S. Conference of Mayors, where 500 Mayors signed an agreement in May 2007 to beat the Kyoto protocol targets of 7 percent below 1990 levels by 2012. The Mayors will also lobby state and federal governments for a cap-and-trade program for greenhouse gases.

State

In June 2006, Governor Schwarzenegger issued Executive Order S-3-05. It calls for a reduction in greenhouse gas emissions to 2000 levels by the year 2010, reductions to 1990 levels by the year 2020, and reductions in the year 2050 that will be 80 percent lower than 1990 emissions levels.

Executive Order S-01-07 was signed by the Governor in January 2007. It required that a low carbon fuel standard be one of the CARB early action measures. By the year 2020, the carbon intensity (the ratio of carbon dioxide to energy) of transportation fuels in the state will be reduced by 10 percent. This can be achieved by reformulation and alternative fuels.

AB 32, which is described below, will be a significant state effort. The CEC and the California Public Utilities Commission (CPUC) also have major roles in developing recommendations for how to regulate greenhouse gas emissions from the utility sector, in setting appropriate rate structures, and developing energy efficiency standards. In addition, there is the state Climate Action Team (CAT) which is comprised of representatives from all state agencies.

The California Global Warming Solutions Act of 2006, or AB 32, was adopted in September, 2006. It establishes a comprehensive program of regulatory and market mechanisms to reduce California's greenhouse gas emissions.

AB 32 established CARB as the responsible agency for monitoring and reducing GHG emissions. The key requirements are listed below, with a description below of work that has been completed or a status report on efforts under development. The bill requires CARB to:

- Establish a statewide greenhouse gas emissions cap for 2020, based on 1990 emissions by January 1, 2008.
  In November 2007, CARB approved a 1990 emissions inventory level of 427 million metric tons of CO_2 equivalents (CO_2eq). This will require 173 million metric tons of CO_2eq reductions from 2020 business-as-usual projected emission levels.
- Adopt mandatory reporting rules for significant sources of greenhouse gases by January 1, 2008.
  Annual mandatory reporting rules for refineries, electricity generators, cement plants, cogeneration, and industrial facilities above 25,000 metric tons, and certain retail providers and marketers were adopted in December 2007. Emissions from the year 2009 will be the first reports required. The rules also require independent third-party verification.
- Adopt a list of discrete, early action measures by July 1, 2007 that can be implemented before January 1, 2010 and adopt such measures.
  In June 2007, the CARB Board approved 3 discrete early action measures. This list was expanded to nine in October 2007. Discrete early action measures are regulatory measures that can be adopted and fully implemented by the year 2010. Early action measures include: low carbon fuel standard, green ports, Smart Way truck measures, methane capture at landfills, perfluorocarbons (PFCs) from the non-electric sector, sulfur hexafluoride (SF6) from semi conductor manufacturing, reduction in high global warming compounds in refrigerants and consumer products, and tire inflation.
- Adopt a Scoping Plan by January 1, 2009 indicating how emission reductions will be achieved from significant greenhouse gas sources via regulations, market mechanisms and other actions.
  Work is in progress, with a draft Scoping Plan due out for public review by the end of June, a supplement in July with results of economic modeling, a revised draft Plan in October, and a public hearing scheduled for November 2008.
- Adopt regulations by January 1, 2011 to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gases, including provisions for using both market mechanisms and alternative compliance mechanisms.
  This work is part of the Scoping Plan development, and there are also working groups for individual sectors, and program design, including market mechanisms and alternatives.

The California Climate Action Registry (CCAR) was formed by the state in 2001 to serve as a voluntary greenhouse gas registry. There are currently over 300 members, including the AQMD, who report emissions through a standardized process, and have the emission inventories verified by an independent third-party. According to correspondence received by staff from TCR, TCR

will be taking over the emission inventory aspect of this agency. The focus of CCAR will shift to protocol development and tracking and registering voluntary reduction projects.

Local

Climate change, a global problem, needs efforts at the local level in order to be effectively addressed. Many cities, councils of government, counties, and other local entities are integrating climate change into their general plans, policies, and purchasing decisions.

APPENDIX B
OTHER CARBON TRADING PROGRAMS

This appendix describes carbon trading programs in Europe, under the Kyoto Protocol and outside the Kyoto Protocol, and trading in the United States.

European Carbon Credits under the Kyoto Protocol

The Kyoto Protocol for greenhouse gas reductions was established in 2003 and came in force in February 2005. The Kyoto Protocol was the product of a series of negotiations following the adoption of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992. Under the Kyoto Protocol, Annex I countries are committed to greenhouse gas emission targets through the establishment of an allowance system.[1] The trial period for implementing the targets was from 2005 to 2007. This first implementation period (commitment period) is from 2008 to 2012 to reduce greenhouse gases by 8% from the 1990 level. Countries in Annex I with the obligation of reducing greenhouse gases can resort to a number of means to fulfill the obligation.

In this regard, Europe established a multi-national trading system—the European Union Emissions Trading Scheme (EU ETS)—under which each Member State publishes a National Allocation Plan. The allowances were first assigned to sectors and then distributed to installations (facilities) within a sector. Approximately 11,500 large installations in certain industrial sectors are covered so far. These installations account for 2.1 billion tons of CO_2 annually—45 percent of CO_2 in the EU. The allowances represent the amount of greenhouse gas that each Member State is allowed to emit—Assigned Amount Units (AAUs). Each AAU represents one metric ton of carbon dioxide equivalent (tCO_2e).

Participants of EU ETS can trade credits from AAUs and carbon credits generated from projects under the Clean Development Mechanism (CDM) and Joint Implementation (JI). All these credits are fungible and each credit represents a unit of tCO_2e. Under the Kyoto Protocol, emissions trading is allowed between Annex I countries, but not between Annex I and non-Annex I countries.

Clean Development Mechanism (CDM)

CDM was established in 2003 and is a global market for emission reductions in six types of greenhouse gases – carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. A CDM project is aimed at reducing or sequestering greenhouse gases in a developing country (non Annex I countries) to offset carbon emissions in an industrialized country (Annex I country). Credits generated from carbon-reducing projects are called Certified Emission Reductions (CERs). Those from carbon-sequestering projects such

[1]There were 36 countries with developed economies—Annex I—that committed to greenhouse gas emission reductions in the UNFCCC. The list expanded to 39 countries—Annex B—under the Kyoto Protocol. Annex I and Annex B are used interchangeably.

In 2005, U.S. (who has not ratified the Kyoto Protocol) and Australia (did not ratify the Kyoto Protocol until 2007) initiated the Asia-Pacific Partnership (APP) with other countries in Asia and Canada. APP rejects the Kyoto emission target, instead, promotes the use of clean fossil-fuel and renewable energy.

as afforestation and reforestation are awarded temporary CERs (t-CERs) or long-term CERs (l-CERs).[2]

A low-carbon project in a developing country can earn credits equivalent to the difference between the emissions that would have been released under the status quo and those under the project. There are private verifiers for emission reductions who are accredited by the CDM Executive Board. The process for certifying these emission reductions includes:

1. Develop a CDM project design documentation (PDD) and have it validated;
2. Apply for registration to the Executive Board;
3. Implement the project and the registered monitoring plan;
4. Submit a monitoring plan for verification; and
5. Certify and issue emission reductions.

The period within which credits for emission reductions are issued is either a twice-renewable 7-year period, totaling 21 years or one fixed 10-year period. Thus, the credit period does not necessarily correspond to the life of a project. The renewal is not guaranteed. The type and the starting date of the credit period must be indicated in a PDD.

China currently has the largest share (44%) of the CDM projects. Of all the CDM projects, those attaching waste gas incinerators to refrigerant gas (HCFC-22) manufacturing plants generated the greatest number of credits [relating to the reduction in HFC-23 (trifluoromethane)]—28 percent of all CDM projects.

Investments in CDM projects depend on prices of carbon credits. During the trial period (2005-2007), the carbon prices had plummeted from $40 per ton of CO_2 to $1 due to over-allocations. There has been some gaming activity on delaying installation of low-carbon projects to obtain higher baseline emissions from existing technology, thus garnering more credits from the projects. Because of the difficulty in establishing the baseline emissions in some cases, investors have opted for marginal end-of-pipe technologies instead of process changes.

There are three business models behind the operation of CDM: unilateral, bilateral, and multilateral (hybrid). Under the unilateral model, a non-Annex I country initiates and independently carries out a project whose credits are purchased by Annex I countries. The purchase can be made before (forward CERs) or after the credits are generated. A project under the bilateral model is an equity investment in a non-Annex I country made by an entity in an Annex I country. The project may be a joint venture of both countries. The multilateral model works similarly to hedge funds where a fund manager pulls funds from Annex I countries to invest in CDM projects whose credits are then distributed among fund contributors. Investing in multiple projects can also leverage risks in these projects.

[2]t-CERs and l-CERs have to be replaced by permanent reductions sometime in the future. t-CERs expire at the end of the commitment period following the commitment period in which they were issued. l-CERs expire at the end of a crediting period which can be from 20 to 60 years with 10-year increments in between. Therefore, the prices of t-CERs and l-CERs will be less than those of CERs.

The Prototype Carbon Fund (PCF) established by the World Bank in 1999 is a good example under the multilateral model. The World Bank currently operates six other carbon funds.[3] The Netherlands has used public money to set up the Certified Emission Reductions Unit Procurement Tender (CERUPT) to purchase forward CERs through a bidding process. Singapore also has established the Singapore-ASEAN Carbon Fund in 2003 for the same purpose.

Joint Implementation (JI)

Joint Implementation (JI) is a greenhouse gas reduction or sequestration project in an Annex I country (host country) by another Annex I country (investing country). All Annex I countries are developed or industrialized countries that are committed to the emission targets in the Kyoto Protocol. The resulting credits from a greenhouse gas reduction project are called Emission Reduction Units (ERUs). Credits from land use, land use change, and forestry projects in a home Annex I country are called Removal Units (RMUs). Similar to the operation of CERs, there are government and institutional investors of ERU-generating projects such as the World Bank's PCF and the Netherlands' Emission Reduction Unit Procurement Tender (ERUPT).

The majority of the JI projects are in Central and Eastern Europe. There are two tracks to be followed for generating ERUs. Track one is for host countries who meet all the requirements specified in the Marrakesh Accords. Track two is for those who meet at least three of the requirements. The requirements are whether the host country is a party to the Protocol, has AAUs calculated or recorded, has a national system for estimating greenhouse gas emissions and sinks, has a national registry, and has submitted the most recent annual inventory and the supplemental information on AAUs. The procedures in terms of project approval, monitoring, verification, and issuance of ERUs are distinct between the two tracks. The majority of Annex I countries have not indicated which track they intend to follow.

Banking

Issuance of CERs prior to the first commitment period (2008-2012) for projects with the start date prior to that period—early credits—is allowed but cannot be earlier than January 1, 2000.

Unused t-CERs, l-CERs, and RMUs from the first commitment period are not allowed to carry over to the next commitment period. AAUs can be carried over. However, ERUs not converted from RMUs and CERs may be carried over to the next commitment period provided they do not represent more than 2.5 percent of the allocation that the facility holds for that year.

Carbon Credits Outside the Kyoto Protocol

Internationally, a similar trend also prevails outside of the Kyoto compliant framework to generate carbon credits under various currencies. There have been many entities pursuing carbon-neutral activities by investing in greenhouse gas reduction projects in developing countries or by purchasing credits generated from these projects to meet the Kyoto obligations.

In recent years, these markets have experienced rapid growth because they do not need to comply with the strict regulatory standards that are necessary under the Kyoto Protocol.

[3]Carbon funds also invest in projects in Joint Implementation.

Although these markets are smaller, they allow individuals, businesses and non-governmental organizations to participate in offsetting greenhouse gas reductions outside the Kyoto Protocol compliance market. The structure of these voluntary markets operates similarly to those implemented under the Kyoto Protocol's CDM. The voluntary market permits countries that have not ratified the Kyoto Protocol to participate in emissions trading by generating Verified Emissions Reductions (VERs) through a wide variety of projects.

Voluntary Carbon Markets in the United States

In the U.S. voluntary carbon markets have and will be generated under the Regional Greenhouse Gas Initiative (RGGI), the Chicago Climate Exchange (CCX), CCAR, and the Climate Trust by the state of Oregon.

RGGI

RGGI is an agreement originally signed in 2005 by the Governors of 7 northeastern and mid-Atlantic states: Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, and Vermont. Massachusetts and Rhode Island both joined RGGI in early 2007, and Maryland joined in April 2007, bringing the number of member states to 10.

The states agree to cap emissions from fossil-fuel fired electric generation plants larger than 25 MW at current levels for 2009. A cap-and-trade program is in place with a 10 percent decrease in greenhouse gas emissions by 2019.

A model rule has been developed and that rule will be modified and adopted by each state. The compliance period is 3 years, and allowances are generally to be auctioned to the facilities. Each allowance is equal to one ton of CO2 equivalent, and the model rule includes 25 percent of the allowances be used to support consumer benefit programs. Early Reduction Allowances (ERAs) are granted to projects that reduce by May 1, 2009.

The model rule allows unlimited banking, and the 3-year compliance period can be extended to 4 years if certain price triggers occur. There is no borrowing outside of the compliance period. Offsets can be used to meet 3.3 percent (5 percent or 10 percent if level 1 or 2 price triggers occur) of a facility's needs. Offsets can be from one of the participating states or another U.S. state with a memorandum of understanding. There are currently 5 types of projects that can produce offsets: landfills, reduction of SF6, afforestation, end-use energy efficiency in the building sector, and agricultural manure management. There are two tests for additionality: regulatory and financial. Financial additionality is typically determined on a case-by-case basis.

RGGI has chosen several different organizations to help implement the program. World Energy Solutions runs a quarterly regional auction. Perrin Quarles is responsible for the development and implementation of the emissions and allocations tracking system. Services related to offsets are done by ICF International, and the Greenhouse Gas Management Institute is responsible for certification of verifiers.

CCX

CCX defines itself as "the world's first and North America's only active voluntary, legally binding integrated trading system to reduce emissions of all six major greenhouse gases." Since its launch in 2003, CCX currently has over three hundred members which include corporations,

states, municipalities, educational institutions and non-governmental organizations. Members join CCX voluntarily, but make a legally binding commitment to meet annual emission reduction goals. Annual emission allowances are allotted to members in accordance with their emission baseline as outlined in the CCX Emission Reduction Schedule (see box).

Phase 1 (2003-2006)

- Baseline: average of annual emission from 1998-2001
- Members commit to reduce emissions a minimum of 1% per year, for a total reduction of at least 4% below baseline

Phase 2

- Baseline: same as Phase 1 OR the single year 2000
- Members commit to a reduction that requires year 2010 emission reductions of at least 6% below Baseline

The tradable commodity of the CCX is the Carbon Financial Instrument (CFI), with each CFI representing 100 metric tons of CO2 equivalents. CFIs can be issued as allowance credits to emitting members according to their baseline, or as offset credits produced by qualifying offset projects. All projects are required to undergo third party verification by a CCX approved verifier. The Financial Industry Regulatory Authority (FINRA), created in 2007 through consolidation of the National Association of Securities Dealers (NASD) and certain functions of the New York Stock Exchange, inspects all verification reports for accuracy and completeness. Trading is done through an electronic internet-based program, or parties can trade outside this system and register with CCX.

Other exchanges affiliated with the CCX include the Chicago Climate Futures Exchange (CCFE), Montreal Climate Exchange (MCeX) and the European Climate Exchange (ECX), which accounts for 80-90% of total exchange traded in the European Union Emissions Trading Scheme. Currently in development in the United States, the California Climate Exchange (CaCX) seeks to develop financial instruments applicable to AB 32. The New York Climate Exchange (NYCX) and the Northeast Climate Exchange (NECX) plan to develop instruments for the northeast Regional Greenhouse Gas Initiative (RGGI).

Verified Emission Reductions (VERs)

Outside of the CCX, projects or activities in voluntary markets that reduce greenhouse gases generate verified emissions reductions (VERs).[4] VERs can be sold to companies and individuals whose goal is to voluntarily abate their carbon footprints. However, VERs cannot be purchased by governments or organizations which need to comply with Kyoto regulations because VERs are not tradable under the Kyoto Protocol trading mechanisms. VERs are generated from project-based emissions reductions and can include a large range of project opportunities.

[4]VERs stands for Verified Emissions Reductions or Voluntary Emissions Reductions. Used interchangeably, both refer to emission reductions outside the regulations and procedures under the CDM. A VER represents a reduction of one ton of greenhouse gas emissions in carbon dioxide units.

Without the regulatory standards of the compliance market, more flexibility is given to the types of projects that can be pursued in the voluntary markets.

According to EcoSecurities[5], VERs can be generated from projects that are based in countries that have not ratified the Kyoto Protocol, lack the infrastructure to support CDM project development, have not yet been registered under the CDM, are too minor to substantiate the costs of CDM approval or are projects that have primarily been developed for the voluntary market.

Advantages of the Voluntary Market

The voluntary market makes it easier for a variety of different organizations as well as individuals to participate in reducing greenhouse gas emissions. Since the rules and regulations of this market are not as stringent as they are in the compliance market, smaller scale, less expensive and more diverse projects are able to reach fruition. Projects are also able to reach many different countries, allowing those countries to benefit.

The flexibility given to project types in the voluntary markets can function as a testing ground for projects that could potentially reach the compliance market. For example, forestry projects could gain acceptance into the compliance market if they are proven to be successful in the voluntary market.

Problems with the Voluntary Market

Since the market is largely unregulated and does not adhere to a set of standards or protocols, verification to guarantee claimed emission reductions or credits from a project can be difficult. Though some reductions are verified by an independent third party, many are not. The lack of regulation in the voluntary market has also generated problems. Without a regulatory body, there is a possibility of organizations or individuals purchasing credits that do not reduce emissions.

Project failure is a common problem due to a lack of expertise by project developers. Occasionally, a project can also cause unintended, negative secondary effects on the area within or surrounding the project area. For example, a tree-planting project in a developing country may use up a limited resource such as water, and this could potentially result in a shortage to the water supply.

[5] Based in Ireland and with offices in over 20 countries, EcoSecurities is a company that sources, develops and trades emission reduction credits from projects that reduce greenhouse gas emissions. http://www.ecosecurities.com

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APPENDIX C
DEFINITION OF SURPLUS IN OTHER PROGRAMS

The definition of surplus for various credits and programs varies but it is definitive that a credit must be beyond what is required to be considered "surplus." Programs were reviewed and categorized as federal, state, or local for analysis purposes. This information is being provided for background. The SoCal Climate Solutions Exchange will establish a definition for "surplus" or "additionality" that is most suitable for its purpose. Each protocol for generation of certified reductions would specify how reductions would be calculated to ensure that reductions would meet the test of additionality.

Federal

The Emissions Trading Policy Statement (ETPS) was promulgated by the EPA, December 4, 1986 and replaced the earlier Bubble Policy. It defined surplus to be "At minimum, only emission reductions not required by current regulations in the SIP, not already relied on for State Implementation Plan (SIP) planning purposes, and not used by the source to meet any other regulatory requirement….".

The federal Economic Incentive Program (EIP) (EPA-4521-D-99-001, September, 1999) defined emission reductions as "surplus" for this program so long as they were not otherwise relied on for: the SIP, the SIP-related requirements such as transportation conformity, other state air programs not in the SIP, federal rules that focus on reducing precursors of criteria pollutant such as new source performance standard (NSPS), rules for reducing volatile organic compounds promulgated under section 183 of the Clean Air Act (CAA), and statutorily mandated mobile source requirements. Nor can emission reductions resulting from compliance with a consent decree be claimed.

State

The Carl Moyer Memorial Air Quality Standards Attainment Program was established by the state legislature in 1999 (Health and Safety Code 44275, et. seq.). This program provides funding for mobile source reductions, defines a reduction as surplus if it is not required by: any federal, state or local regulation, a memorandum of agreement/understanding with a regulatory agency; a settlement agreement; a mitigation requirement; or other legal mandate. In order to be eligible for funding, the reduction must be surplus for a minimum of 3 years prior to the regulatory requirement. The project life varies depending on the mobile source category, with a minimum of 3 years surplus.

Local

New Source Review (NSR), as adopted by the AQMD, defines a credit as surplus if it is not: required by a control measure in Air Quality Management Plan (AQMP) with an assigned target implementation date; required by a proposed District rule for which the first Public Workshop has been held; required by adopted federal, state or District rule, regulation or statute; or category or class of equipment included in a demonstration program required by a District rule or regulation. In reality, it is the difference between current Best Available Control Technology (BACT) and reduction by an air pollution control device or shutting down. There is an offset requirement of 1.2 to 1.

Rule 108 – Alternative Emission Control Plans was adopted by the District in March 1990 in response to EPA's ETPS. This rule defines "surplus" as meaning "the emission reductions are not required by current SIP regulations, are not a measure in Tier I of the AQMP, or relied upon for SIP planning purposes, and are not used by the source to meet any other regulatory requirements."

The District administers two Vehicle Scrapping programs: High Emitter Repair or Scrap (HEROS) and Rule 1610 - Old-Vehicle Scrapping. Vehicle scrapping through the HEROS program is funded through the Carl Moyer program. HEROS uses CARB Voluntary Accelerated Vehicle Retirement Regulation (VAVR) factors for credit generation and calculates offsets for vehicle replacement. The Voluntary Repair Vehicle program (VRV) gives 1-year credit and must be surplus to Smog Check Credit. The life of the repair is the period of time between the repair and the vehicle scheduled Smog Check. All mobile source credits are for a limited time. All scrapping is voluntary and thus all credits are considered surplus.

The District has adopted many mobile source credit generation rules. Rule 1610, adopted January 1993, gives credits for voluntary vehicle scrapping. Scrapping a vehicle is voluntary and thus surplus. Credits generated through Rule 1610 are used to offset Rule 2202 – On-road Motor Vehicle Mitigation Options, commute trip reduction obligations. Rule 1610 uses CARB VAVR factors to calculate the emission reduction credits.

The District also adopted several mobile source pilot credit rules (1631, 1632, 1633, and 1634), which are no longer in effect. These rules defined "surplus" to mean "that emission reductions achieved throughout the duration of the emission reduction activity that are not required or relied upon by any local, state, or federal rule, or regulation, and the federal CAA; and are not required or relied upon in an attainment demonstration, reasonable further progress demonstration, or emissions inventory thereby ensuring that there is no double counting of emission reductions." These rules all included a date by which credit generation applications were due, and a provision requiring periodic determinations by AQMD, CARB, and EPA, in order to ensure that reductions would be surplus.

APPENDIX D
KEY STAKEHOLDER COMMENTS

Staff met with the Technical Advisory Group for the SoCal Climate Solutions Exchange on March 19, 2008, April 2, 2008, and May 22, 2008. The following information summarizes the key comments raised at those meetings and from written comments. The comments helped form the suggested staff approach contained in this White Paper.

General Comments and Potential Use of Reductions

Many of the participants were supportive of the concept, but expressed concern that it is difficult to develop a voluntary reduction program in the absence of a more defined state program. Business needs to have certainty that reductions will have use and value in future programs in order to make financial investments. Parties also need assurance that reductions will help protect them against future regulations that may require more reductions or a different technical approach. Technical Advisory Group members recommended that AQMD staff work to influence future state or federal requirements to ensure that businesses making voluntary early reductions do not end up being penalized, but are recognized and accounted for in some way in future source-specific regulations, a cap-and-trade program, or other programs.

It was suggested that rule development would be too resource intensive and less flexible than if the Board certified an initial program, with rule development to follow after CARB adopts the AB 32 Scoping Plan.

Geographic Scope

Some stakeholders questioned why staff would limit projects to within the District only. They understood that the issue was verification of reductions, but would like to see projects outside the District included if future greenhouse gas offset requirements are to be considered by the District; there may be more opportunities for reductions and more cost-effective projects outside the District.

Role of AQMD in the SoCal Climate Solutions Exchange and Oversight

Some members of the Technical Advisory Group expressed concern that AQMD would assume too many roles, if staff was responsible for verifying reductions, issuing certifications, registering reductions, and tracking trades. There should be oversight so that AQMD staff would not be solely responsible for the roles of generation, quantification, issuance, verification and trading. It was hoped that a more modern system could be used than what RECLAIM requires for trading.

Use of Voluntary Reductions

A comment was raised that this voluntary program will be used heavily for CEQA mitigation, and there are concerns that purchasing AQMD certified reductions may become mandatory for CEQA projects. Another related comment was that AQMD staff should not presuppose that certified emission reductions would be used for CEQA.

It was recommended that the SoCal Climate Solutions Exchange be designed to link to other programs and that the currency needs to be fungible. A single place for registration might be beneficial to support the goal that these voluntary early reductions are recognized.

Co-Benefits
Projects would have more incentives if any co-benefits for criteria or toxic pollutants were retained by the party responsible for the project. Co-benefits would have to meet the same criteria to be considered surplus, quantifiable, etc. Toxics reductions could also be banked for later use.

Protocols and Additionality
Interactions with CARB and CCAR are needed for protocol development and use. Staff from both of these agencies indicated their desire and willingness to work with AQMD staff. Priority needs to be given to the determination of "additional." One stakeholder asked that staff wait for the CARB AB 32 Scoping Plan to determine what reductions could be additional. Stakeholders also requested that CARB consider allowing a specific time for reductions to be considered additional regardless of what future regulations require, in order to provide more of an incentive and certainty for potential projects.

There was a recommendation that the focus should be on developing protocols with broad applicability rather than individual, unique projects. Also, protocols should be developed where project proponents are known and priority should be given to protocols that will benefit environmental justice areas.

A concern was expressed that staff is focusing on reductions in emission rates, and should not limit thinking. Projects that encourage energy efficiency, for example, should be considered.

Each protocol must address additionality and how that could change over time. Additionality in many existing protocols includes a component of financial additionality, so the project would not have occurred in the absence of the ability to recover costs through the creation and selling of offsets. Definitions of surplus for other regulatory programs should not constrain the design of protocols and how additionality is determined in that context.

Stakeholders requested that when a project is partially funded by public monies, it should not be disqualified from being eligible to generate certified reductions. Local governments are often required to match bond or other funding to implement needed projects. They would like the ability to obtain certified reductions that are additional. This led to staff's recommendation that the agency approving the funding should affirm whether the reductions would be assumed as part of AB 32 implementation or would be available for generating certified reductions by the recipient of the funding.

It was noted that international practice is to issue reductions retroactively. This convention helps ensure that the reductions are verified before issuance.

Environmental Justice Incentives
It was recommended that staff not include any distance or offset factors for projects that are not in environmental justice areas. Priority and specific incentives should be given to protocols that would result in benefits in environmental justice areas.

Staff was also requested to consider developing protocols and directing funding to projects in environmental justice areas that would have benefits for inner-city areas, such as community aggregation of energy efficiency and other projects from home owners or small businesses.

Greenhouse Gas AQIP

Key comments relative to the AQIP were that it should not compete with private projects; rather it should be a supplement. The AQMD staff should make sure that any projects through the AQIP adhere strictly to the same protocols that private parties would have to follow.

Questions were asked about how fees for the program would be set and how environmental justice areas could receive preference. Criteria for accessing the AQIP would be needed.

APPENDIX E
PROTOCOLS – EXISTING, IN DEVELOPMENT, AND POTENTIAL CANDIDATES

There are some existing protocols that have been approved or adopted by various organizations. Some of these may be ready for use in the SoCal Climate Solutions Exchange, once approved by the AQMD Governing Board. Others may need modifications and staff will evaluate this and bring recommendations to the Board. The intent is to bring as many protocols as possible to provide broad opportunity for early, real greenhouse gas reductions. This Appendix describes some of the existing protocols, those in development, and potential additional protocols that might be useful. This is not an exhaustive list. More work is needed to identify and review protocols.

RGGI

Under RGGI, there are currently 5 types of projects that can produce offsets:

- Landfills;
- Reduction of SF6;
- Afforestation;
- End-use energy efficiency in the building sector; and
- Agricultural manure management

Greenhouse Gas Protocol Initiative

The Greenhouse Gas Protocol Initiative also has protocols for quantifying greenhouse gas benefits of climate change mitigation projects. This was an effort involving the World Resources Institute and the World Business Council for Sustainable Development. Protocols include:

- Project Protocol;
- Land Use, Land-Use Change and Forestry; and
- Grid-Connected Electricity Projects.

CCX

The Chicago Climate Exchange accepts offsets from projects which follow their protocols for:

- Methane capture from landfills, farms, and coal mines;
- New renewable energy;
- New tree planting;
- Soil grazing best management practices;
- Destruction of ozone depleting compounds; and
- Energy efficiency at new or retrofitted warehouses.

CCAR Protocols

CCAR has the following approved protocols that are available for projects in the U.S.:

- Livestock Waste Management (biodigesters);
- Landfill Methane Capture and Combustion; and

- Forest
  - Conservation (Avoided Deforestation);
  - Afforestation/Reforestation; and
  - Forest Conservation Management.

CARB

In October, 2007, the CARB Board approved the 3 forest protocols listed above for early, voluntary reductions.

In February, 2008 the CARB Board approved a policy statement related to voluntary early reductions of greenhouse gases. The policy states the intent to recognize voluntary early actions in the enactment of AB 32 and authorizes the Executive Officer to issue Executive Orders for quantification protocol approval. Protocols proposed by potential project proponents will be developed or reviewed by CARB staff to ensure that reductions would be additional, real, quantifiable, verifiable, permanent and enforceable. Once a protocol is approved, it will be posted so other parties can use it for additional reductions. The CARB February policy statement on voluntary, early reductions, included that CARB would work with the South Coast AQMD and others to develop quantification protocols.

Potential Candidates

In May, CAPCOA representatives (including AQMD) met with CARB and CCAR to discuss sharing resources and expertise for further protocol development. Protocols that have wide applicability and have project proponents will be considered, as will the amount of potential co-benefits and environmental justice.

CARB has not yet received any formal project recommendations yet in response to the February policy statement, but indicated that they expect to see proposals for early voluntary reductions of the following types: electrification at truck stops and of forklifts and agricultural pumps, urban forestry, and energy efficiency.

CCAR is currently working on the following protocols:

- Bus rapid transit;
- Blended cement; and
- Tidal wetland sequestration (farms converting to wetlands).

In addition, CCAR is evaluating several categories for potential protocol development, including waste diversion, local government operations, boiler efficiency; and truck stop electrification. CCAR has been asked to look at other areas, such as waste water biogas, natural gas pipelines, agricultural soil sequestration, and CO_2 capture and storage, and those will be evaluated in the future.

At the May meeting, several air districts volunteered to lead or assist in the development of protocols. AQMD will lead development on a truck stop electrification protocol. Other air districts will work on offshore oil operations, diatomaceous earth, boiler efficiency, semi conductors, biomass to energy in forests, avoided wild fires, increased growth rates in forests, geothermal energy and community reduction projects. Other potential protocols include natural

gas pipelines and replacement of high global warming refrigerants. These efforts will be coordinated through CAPCOA, CARB, and CCAR to develop protocols that can be adopted for use in all of the programs offered by the air districts or these other agencies. A Memorandum of Understanding will be developed to outline the process and timelines for this work to ensure timely review and input. As other stakeholders identify the need for other protocols, resources and expertise will be shared to develop as many protocols as possible.

APPENDIX F
ACRONYMS

AAU – Assigned Amount Unit

AB – Assembly Bill

APP – Asia-Pacific Partnership

AQIP – Air Quality Investment Program

AQMD – Air Quality Management District

AQMP – Air Quality Management Plan

BACT – Best Available Control Technology

CAA – Clean Air Act

CAT – Climate Action Team

CaCX – California Climate Exchange

CAPCOA – California Air Pollution Control Officers Association

CARB – California Air Resources Board

CCAR – California Climate Action Registry

CCFE – Chicago Climate Futures Exchange

CCX – Chicago Climate Exchange

CDM – Clean Development Mechanism

CEC – California Energy Commission

CEQA – California Environmental Quality Act

CER – Certified Emission Reductions

CERUPT – Certified Emission Reductions Unit Procurement Tender

CFI – Carbon Financial Instrument

CO_2 eq – Carbon Dioxide Equivalent

CPUC – California Public Utilities Commission

ECX – European Climate Exchange

EIP – Economic Incentive Program

EPA – Environmental Protection Agency

ERA – Early Reduction Allowances

ERU – Emission Reduction Unit

ERUPT – Emission Reductions Unit Procurement Tender

ETPS – Emissions Trading Policy Statement

EU ETS – European Union Emissions Trading Scheme

FINRA – Financial Industry Regulatory Authority

HEROS – High Emitter Repair or Scrap

ICLEI – International Council for Local Environmental Initiative

IPCC – Intergovernmental Panel on Climate Change

JI – Joint Implementation

MCeX – Montreal Climate Exchange

NASD – National Association of Securities Dealers

NECX – Northeast Climate Exchange

NSPS – New Source Performance Standard

NSR – New Source Review

NYCX – New York Climate Exchange

PCF – Prototype Carbon Fund

PDD – Project Design Documentation

PFC – Perfluorocarbon

RECLAIM – Regional Clean Air Incentives Market

RGGI – Regional Greenhouse Gas Initiative

RMU – Removal Unit

SF6 – Sulfur hexafluoride

SIP – State Implementation Plan

TCR – The Climate Registry

UNEP – United Nations Environment Programme

UNFCCC – United Nations Framework Convention on Climate Change

U.S. – United States

VAVR – Voluntary Accelerated Vehicle Retirement

VER – Verified Emissions Reductions or Voluntary Emissions Reductions

VRV – Voluntary Repair Vehicle

WCI – Western Climate Initiative

WMO – World Meteorological Organization