More of The Great Green Hope
California Carbon Trading for Climate Change Improvements

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By
Peter Hsiao, Susan Linden and Meredith J. Klein[1]
Morrison & Foerster LLP

Introduction

California's Global Warming Solutions Act of 2006 (AB 32) is one of the many state-led efforts to aggressively advance the agenda of environmental regulation for climate change improvement. Propelled by the efforts of Governor Arnold Schwarzenegger and California Attorney General Jerry Brown, the state's political groups and regulatory agencies have committed to reduce the level of greenhouse gas emissions (GHG) which increase global temperatures. The program is dramatic in its premise that a state comprising the world's eighth largest economy could dictate policy to and lead the way possibly for the world's largest national economy.[2]

Under AB 32, the California Air Resources Board (ARB) has set forth a statewide GHG emissions cap to reduce emissions to 1990 levels as the baseline, and to achieve those reductions by 2020. By January 1, 2009, ARB must adopt a plan for achieving emission reductions from these significant sources using a combination of regulations, market mechanisms and other actions. By January 1, 2011, regulations must be adopted to achieve the maximum technologically feasible and cost-effective reductions in GHGs and may include provisions for the use of both market and alternative compliance mechanisms within the regulatory mix. In the course of developing the requirements to implement the program, ARB is required to consider a number of factors, including impacts on the California economy, environment and public health;

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[1] © 2007. Mr. Hsiao is a partner and head of the Land Use and Environmental Law group for the Los Angeles office of Morrison & Foerster, and head of the firm's Green Chemistry Group. He was formerly the senior trial attorney for environmental and natural resources cases at the U.S. Attorney's Office in Los Angeles, and Chair of the Environmental Law Section of the State Bar of California. Ms. Linden and Ms. Klein are environmental analysts at Morrison & Foerster.

[2] A search on the Thomas legislative website yields over 130 bills introduced into the 110th Congress to address greenhouse gases. http://thomas.loc.gov/ Several of them – S. 1324, S. 1073, H.R. 1590 – are modeled on portions of the California program. On August 1, 2007, California's Attorney General and those in 12 other states announced their intention to Congressional leaders that California's GHG vehicle standards should be preserved and not subject to a federal override in energy legislation. http://ag.ca.gov/cms_pdfs/press/2007-08-01_LettertoSpeaker.pdf On September 12, 2007, the U.S. District Court of Vermont decided in *Green Mountain Chrysler v. Crombie*, 508 F.Supp. 295, appeal to 2nd Circuit pending, that California's greenhouse gas emission standards for new automobiles (standards that were subsequently adopted by Vermont) are not preempted by federal fuel efficiency laws.

equity between regulated entities; electricity reliability; and conformance with other environmental laws. Any adopted regulations also must ensure that low-income communities are not disproportionately affected. [3]

AB 32 – Cap and Trade vs. Early Action

One critical element of the AB 32 regulatory components – the development of a "cap and trade" system – has been controversial, technically and as a matter of best policy. Air quality permitting programs are generally one of two types: 1) command and control directives, or 2) use of allowable market forces such as cap and trade that provide incentives for emission control. Traditional command and control programs set specific limits on emissions from each piece of equipment and process at a facility, and permits are required for each piece of regulated equipment. Under AB 32, the state proposes to allow capping and/or trading of the increases and decreases of GHG emissions from many industrial sectors to bring about net reductions and avoid sector-by-sector command and control regulation if practicable.

The AB 32 statute defines its term "market mechanism" to mean either:

> (1) A system of market-based declining annual aggregate emissions limitations for sources or categories of sources that emit greenhouse gases [or]
>
> (2) Greenhouse gas emissions exchanges, banking, credits, and other transactions, governed by rules and protocols established by the state board, that result in the same greenhouse gas emission reduction, over the same time period, as direct compliance with a greenhouse gas emission limit or emission reduction measure adopted by the state board pursuant to this division.[4]

Capping refers to setting a series of declining emission level ceilings over time over an entire sector and allocating "shares" of the emissions among individual sources. The cap can itself create an individualized market mechanism if the emission source is free to determine the way in which it limits its various emissions facility wide – a facility bubble.

Trading allows the capped entities to bargain among themselves to insure that the whole sector meets the cap, no matter who reduces the emission. An individual source may emit more than its individual allocated share under the cap if another source can be made to reduce its share by an equal increment.

Cap and trade programs have several features that are fair topics for stakeholder debate. A key issue is how to set the baseline for the program, and to make the trading of credits enforceable and verifiable, to provide real reductions in GHG. There also is some question as to whether the program is necessary to garner the volume of GHG reductions that AB 32 requires. And while cap and trade programs are proposed to be more efficient, cost-effective and impose a

[3] Calif. Health and Safety Code §38500 et seq.

[4] California Health and Safety Code §38505(k).

lower burden on all stakeholders, including the broad public, there are alternatives as demonstrated by the early action measures and other proposed carbon taxes, or command and control strategies.[5]

AB 32 is comprehensive in its emission reduction targets and how to achieve them. The "emissions" to be taken into account may include those from outside the State's borders but for which the State is thought to be responsible. The rules are to be designed to avoid "leaking," that is, driving emissions out of California only to be emitted elsewhere where the rules are less stringent. To reach the target, ARB will act as the coordinating agency with other state agencies, most notably the California Public Utilities Commission (CPUC) and California Energy Commission, having jurisdiction over GHG emissions.

One of the first tasks ARB was required to perform is to identify a set of "early action items" or rulemakings that could put GHG reduction measures into place with quantifiable results. Even without the use of a cap and trade program, the agency reported significant opportunities to reduce GHGs. On June 21, 2007, ARB developed 37 separate activities that it estimated would reduce GHG emissions towards meeting the overall goal of ~174 million metric (MM) tons of CO_2 equivalent by 2020, 3 of them "discrete" early measures that can be enforceable by January 1, 2010.[6] On October 25, 2007, ARB expanded the adopted list to 44 total measures, 6 of which were actions added to or reassigned as "discrete."[7]

The actions range from noble to modest, from low carbon content fuels measured over the lifecycle of the fuel to revising the levels that tires are inflated. Newly proposed discrete measures include reducing high global warming potential gases in consumer products and

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[5] AB 32 requires ARB in all of its regulatory mechanisms including market based mechanisms to:

(1) Design the regulations, including distribution of emissions allowances where appropriate, in a manner that is equitable, seeks to minimize costs and maximize the total benefits to California, and encourages early action to reduce greenhouse gas emissions.

(2) Ensure that activities undertaken to comply with the regulations do not disproportionately impact low-income communities.

(3) Ensure that entities that have voluntarily reduced their greenhouse gas emissions prior to the implementation of this section receive appropriate credit for early voluntary reductions.

(4) Ensure that activities undertaken pursuant to the regulations complement, and do not interfere with, efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions.

(5) Consider cost-effectiveness of these regulations.

(6) Consider overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health.

(7) Minimize the administrative burden of implementing and complying with these regulations.

(8) Minimize leakage.

(9) Consider the significance of the contribution of each source or category of sources to statewide emissions of greenhouse gases. Calif. Health & Safety Code §38562(b).

[6] http://www.arb.ca.gov/cc/ccea/meetings/091707workshop/091707notice.pdf and http://www.arb.ca.gov/cc/ccea/meetings/042307workshop/early_action_report.pdf.

[7] http://www.arb.ca.gov/cc/ccea/meetings/ea_final_report.pdf

providing alternative power sources to ships docked at ports. The recommendations from other agencies are in addition to those ARB developed, and they are estimated to reduce GHG 77 MM tons of CO_2 equivalent.[8] Looking at the most significant emission sectors, ARB staff recommended, and ARB approved a total statewide aggregated GHG emissions level of 427 MM tons CO_2 equivalent in 1990; in its report, ARB staff found net aggregated GHG emissions of 480 in 2004, a difference of 53.[9] The CPUC claims:

> Since 2001 the California's Investor-Owned Utilities (IOUs) have incented over 55 Million CFLs [compact fluorescent lamps] to residential customers saving approximately 3,000 gWhs [gigawatt hours]. This has reduced CO_2 emissions by an estimated 1,640,000 tons ….
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> Over the past five years, California's IOUs have saved approximately 9,000 gWhs through their energy efficiency programs. This is equivalent to six average size power plants running for one year and has reduced CO_2 emissions by approximately 4,900,000 tons.
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> Since 2001 California IOUs have saved over 460 gWhs as a result of their Refrigerator Recycling Program. This has reduced CO_2 emissions by over 250,000 tons ….
>
> Over the past 15 years, California IOUs have given rebates for over 812,000 refrigerators saving over 200 gWhs as a result of their Refrigerator Replacement Program. This has reduced CO_2 emissions by over 111,000 million tons [sic].[10]

Of the combined reductions the early action reports describe, few or none are dependant on establishing a market based cap and/or trade mechanism to achieve them. Newer climate change proposals may go further and set targets of 75 or 80% of 1990 levels by the year 2050.

ARB's Market Advisory Committee Report on Cap and Trade

On June 30, 2007, the ARB's Market Advisory Committee (Committee) released its final recommendations report to craft a cap and trade emissions program. The Committee presented its report to the ARB on July 27, 2007.[11] In the Committee's view, capping and trading are

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[8] The recommendations of other agencies are at http://climatechange.ca.gov/climate_action_team/reports/2007-04-20_CAT_REPORT.PDF.

[9] http://www.arb.ca.gov/cc/inventory/pubs/reports/staff_report_1990_level.pdf

[10] http://www.cpuc.ca.gov/static/energy/electric/energy+efficiency/r0604010pd.htm

[11] Recommendations for Designing a Greenhouse Gas Cap-and-Trade System for California Recommendations of the Market Advisory Committee to the California Air Resources Board http://climatechange.ca.gov/publications/market_advisory_committee/2007-06-29_MAC_FINAL_REPORT.PDF and http://www.arb.ca.gov/board/mt/2007/mt072707.txt

inseparably linked; it did not recommend any principles based on capping at a single source with a bubble alone.

The Committee further expressed uncertainty about whether the cap and trade program it recommended would save money and be cost effective.[12] The report recommends:

- In 2020, the emissions cap in a California GHG trading program should be set equal to total allowable emissions under the Global Warming Solutions Act minus projected emissions from sources and sectors not covered by the cap and trade program.
- ARB should start with a higher cap and reduce the cap level gradually such that the cap level by 2020 is consistent with meeting the overall emissions target of the Act.
- In general, ARB should seek to expand the cap and trade program over time so that it covers as many sectors, sources, and gases as practicable.
- As soon as possible, ARB should adopt mandatory reporting requirements for all sources likely to be covered by a GHG emissions cap.
- For non-combustion CO_2 emissions and for the non- CO_2 greenhouse gases, an emissions-based approach should be adopted where possible, with an upstream approach used for certain high-GWP gases.
- For CO_2 emissions from combustion, the sense of the Committee is to prefer a cap and trade program design in which (1) the program initially covers first sellers of electricity and large industrial emitters, and (2) the transportation and buildings sectors are added in subsequent phases as soon as ARB determines that emissions in those sectors can be monitored, and that the administrative costs of extending coverage to those sectors are not prohibitive. However, a few members of the Committee prefer an upstream approach that imposes the compliance obligation on fuel suppliers upstream and thereby provides broad coverage from the outset.
- As a general matter, fugitive emissions and emissions from biological processes are too difficult to monitor and therefore should not be covered under the cap and trade program. The Committee encourages ARB to examine ways to improve monitoring of fugitive and biological process emissions, as a first step toward incorporating certain emissions of those types in a cap and trade system.

The Committee's only specific industry recommendations were directed to the utility industry. Particularly controversial is a proposal to place the legal obligation for complying with the cap on GHG emissions, and to potentially pay at auction for emission allowances, on the "first-seller" of power into California's electricity market, no matter where the power is generated. However, sales of power at the wholesale level are already regulated under the Federal Power Act and subject to the Interstate Commerce Clause.

The stakeholders are heavily engaged in submitting comments on whether such regulation of the power industry is subject to challenge under the Supremacy and Commerce Clauses and to review its feasibility and benefits. On September 7, 2007, without finally deciding on a "first- seller" rule, the CPUC filed a decision asking ARB to adopt rules for power

[12] Id. transcript, p. 40.

providers and marketers. These rules would require the regulated parties to track and report GHG emissions using assigned "relative emission factors" to attribute CO_2 emissions to the amount of megawatt hours generated, depending how the energy is procured from in-state and regional sources, and to report exports and imports of electricity.[13] The requirements for marketers would provide ARB with the information it needs if a first-seller approach is adopted. According to the CPUC, the decision is also designed to tackle the confusing effects of "contract shuffling", to estimate emissions when power is resold or repackaged multiple times before retail purchase, or without regard to whether the power would have been sold anyway, regardless of GHG levels. The CPUC intends to conduct further analysis of these effects. Out-of-state entities however have said they may calculate GHG emissions under other methods for their own state reduction programs thus making regional comparability difficult to ascertain.

Among its other overall recommendations, the Committee further explained that:

- State agencies should continue to develop policies that reward and, to the extent possible, require emissions accounting for out-of-state generation.
- A portion of the allowance value created under a cap and trade program should be used to keep the net cost of electricity to consumers from rising too far in the early stages of the program. This could be done by allocating allowances to regulated Load Serving Entities or through direct consumer rebates.
- The Committee believes that over time auctioning should be a key part of allowance allocation under the cap and trade program. In the near term, however, the state should retain flexibility to allocate a share of allowances for free to certain sectors.
- That California use a portion of the allowance value created under a cap and trade program to promote investment in low-GHG technologies and fuels (including energy efficiency), to finance pollution reductions in communities that bear disproportionate environmental and public-health burdens, and to provide transition assistance to workers and firms subject to strong market pressures from competitors located in un-capped jurisdictions.
- Offset credits should not be granted for early action, except in the special case where those credits can be removed from the stock of allowances available to other entities.
- California should use a standards-based approach rather than case-by-case review to assign offset credits. The state should identify specific types of eligible projects, while taking a conservative approach to maximize the environmental benefits of using offsets.
- The sense of the Committee is that California should reject geographic or quantitative limitations on offset credits so as to maximize the opportunity to reduce GHG emissions at the lowest cost. However, some members feel that this and other legitimate policy considerations (for example, social equity, air quality, predictability of prices for

[13] INTERIM OPINION ON REPORTING AND TRACKING OF GREENHOUSE GAS EMISSIONS IN THE ELECTRICITY SECTOR , CPUC Rulemaking 06-04-009. http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/72513.htm Under the assigned values, for example, power obtained from sources in the Southwest United States is assumed to be derived from 90 percent natural gas and 10 percent coal and is therefore assigned a relatively higher factor. Over 350 comments have been filed to date on the overall rulemaking.

participants) warrant quantitative or geographic limitations or both, in which case such limitations could be introduced in initial phases of the program with a view to gradual relaxation or removal once other policy considerations have been adequately addressed. California should only accept offsets from other jurisdictions if they assure a similar level of accountability and project rigor; this may require formal MOUs for implementation.

- California should issue allowances under the cap and trade program that do not expire and may be banked for use in any subsequent compliance period.
- A compliance period of approximately three years in length might offer a reasonable balance between the goals of promoting compliance flexibility and assuring environmental integrity.
- Borrowing of allowances from future compliance periods should not be permitted.
- A safety valve should not be included. Linkages with other mandatory GHG trading systems should be encouraged. Linkages can increase market liquidity and cost-effectiveness and improve the functioning of the cap and trade program without sacrificing environmental integrity or equity and without violating institutional constraints.
- To actively promote a global carbon market, California should encourage linkage only with other mandatory systems, including the existing European Union ETS and the Northeast RGGI, which is due to launch in 2009.

The Public Utilities Commission August 2007 Proposal

On August 9, 2007, the CPUC proposed an additional market mechanism, not contemplated by a cap and or trade program. The CPUC proposed to provide utilities with bonus payments if they succeed in reducing energy use by all customers over the next three years but apply punishment penalties if the energy efficiency targets are too slow.[14] Rate payers would benefit in even greater amounts from the efficiencies achieved. The CPUC issued an order adopting the proposal on September 20, 2007.[15] The CPUC has also separately announced workshops to develop tradable renewable energy credits (RECs) for utilities to use in compliance with California's renewable portfolio standards. [16] On October 29, 2008, the CPUC issued a Proposed Decision Authorizing Use of Renewable Energy Credits for Compliance with the California Renewables Portfolio Standard. [17]

The Public Utilities Commission September 2008 Proposed Opinion

On Sept. 12, 2008, the CPUC and California Energy Commission issued their Proposed Final Opinion on Greenhouse Gas Regulatory Strategies that addressed trading mechanisms to reduce GHG emissions from the electricity sector. *See* http://docs.cpuc.ca.gov/efile/PD/89317.pdf. Some of the highlights from the proposal included guidance on how to distribute emission allowances, one of the most controversial topics under AB 32's emission trading proposals:

[14] http://www.cpuc.ca.gov/static/energy/electric/energy+efficiency/r0604010pd.htm

[15] http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/73172-15.htm#P1154_300919

[16] http://www.cpuc.ca.gov/EFILE/RULINGS/70309.pdf

[17] http://docs.cpuc.ca.gov/efile/PD/92913.pdf

- Starting in 2012, 80 percent of the emission permits or allowances would be distributed for free to the electricity deliverers and 20 percent would be auctioned. Over five years, the percentage auctioned would increase by 20 percent per year, so by 2016, 100 percent would be auctioned.

- The free, administratively allocated emission allowances would be distributed to the deliverers based on their energy output and limited to the emitting entities. The number of allowances would be weighted based on the fuel source (such as coal and natural gas) of electricity delivered. If emitters can reduce the carbon content of their power, the allowances they save can be sold to other entities in the private market.

- All or almost all of the allowances to be auctioned would be granted to the electricity retail providers, on behalf of their consumers. These retail providers would be required to sell the allowances in an independent, centralized auction and would receive the revenues from the auction. This process would ensure open access to these allowances by the deliverers who require them.

- The portion of the allowances to be granted to retail providers for successive auctions would change over time, from allocation on the basis of historical emissions in the retail provider's portfolio to, by 2020, allocation on the basis of electricity sales.

- All auction revenues would be used for purposes related to AB 32, and all revenue from allowances allocated to the electricity sector and received by retail providers would be used for the benefit of the electricity sector to support investments in renewables, efficiency, new energy technology, infrastructure, customer bill relief, and other similar programs.

- The California Public Utilities Commission (for the investor-owned utilities) and the governing boards (for publicly owned utilities) would determine the specific use of retail providers' auction revenues consistent with the purposes of AB 32.

- The ARB may decide to retain a small portion of total emission allowances from the electricity sector, and use the resulting auction revenues to fund statewide energy programs consistent with AB 32.

[The above is quoted from http://www.cpuc.ca.gov/NR/rdonlyres/756A0181-CF94-4A52-98DB-56E2877CF410/0/ProposedFinalOpinionSummary.pdf].

California's Existing Cap and Trade System - RECLAIM

The proposals for AB 32's market mechanism directive is currently heading towards a cap and trade system for GHG reduction. There is an important existing model in California that may set precedent for the AB 32 system. In response to growing concerns with air quality in the Los Angeles basin, the South Coast Air Quality Management District (District) began the Regional Clean Air Incentives Market (RECLAIM) program in 1994. When it was created, RECLAIM was a revolutionary approach to regulating air pollution that the District envisioned

as being able to achieve the same emissions reductions and therefore improvements to air quality, while minimizing impacts on business and the economy.

Under RECLAIM, the first effort was to determine the feasibility of determining a baseline emission inventory. Total emissions from each facility were evaluated and maximum emissions levels were set. Under its cap and trade system, allowable emission limits decline a specific amount each year, and the facility then determines how it will meet the emissions limits set by the District.

Designed to control emissions of nitrogen oxide (NOx) and sulfur oxide (SOx), facilities in the RECLAIM program are permitted to use a variety of means, including add-on controls, operational changes, facility shutdowns, and the purchase of excess emissions reductions, to reduce NOx and SOx emissions. The District's goal was to lower NOx emissions by 70 percent and SOx by 60 percent by 2003 while at the same time meeting state and federal clean air requirements.

Any facility with four or more tons per year of NOx or SOx emissions is eligible to join RECLAIM voluntarily, unless otherwise exempted by District rules. Approximately 400 facilities participate in the RECLAIM program, mostly in the NOx market. Participating facilities include power producers, glass smelters and those with industrial boilers.

When RECLAIM was first introduced in 1994, each facility in the program was assigned an initial allocation for NOx and/or SOx based on peak emissions for that facility. The facilities were allowed to choose a peak year of production between 1987 and 1992, and emissions limits or "caps" were set based on that peak year. Each facility was required to hold RECLAIM trading credits (RTCs) equal to its actual emissions.

Each facility also had its own rate of emission reductions based on control measures established by the District for a particular piece of equipment. For example, when the District established control measures for boilers, facilities with boilers were required to reduce emissions at their facilities to come into compliance with the new rules. Again, each facility was permitted to choose a method to bring emissions into compliance – either by installing control equipment or purchasing RTCs from other facilities. The emissions reductions did not have to come from specific equipment, but rather the facility as a whole.

The RECLAIM program provides each facility with an annual cap and requires quarterly reconciliation checked against the cap. For example, a facility may have a cap of 10,000 pounds of NOx. If that facility uses 9,000 pounds of its cap during the first quarter, and 3,000 pounds in the second quarter, it has exceeded its annual cap. The facility then must either reduce emissions by 2,000 pounds or purchase 2,000 pounds of NOx credits to avoid exceeding the cap. RECLAIM requires facilities to use continuous emission monitoring systems to determine actual emissions and to report these emissions to the District on a daily basis. District rules require reconciliation and reporting of NOx and SOx emissions each quarter within 30 days after the end of the quarter.

Most companies with a "balance" in their account keep what amounts to a compliance buffer of between 10 and 15 percent of their annual cap. The District regularly audits emissions for each RECLAIM facility.

For new facilities with actual emissions greater than four tons per year, the District will not issue Permits to Construct until that facility purchases credits to offset the emissions. In the first five or six years of the program, there was an oversupply of credits. In many instances, it was less expensive for facilities to purchase credits than to install control equipment. In 1999, credits were selling for approximately $1 per pound. In 2000, largely due the emerging energy crisis resulting from old utility plants, the cost of credits shot up to between $50 and $60 a pound. Prices for NOx credits now are around (or just over) $15,000 a ton.

Each facility handles its own trading, and the District maintains records of all trades. New facilities and those seeking to significantly change or expand still must undergo New Source Review (NSR), and those facilities also must comply with Best Available Control Technology (BACT) requirements. If a source will add 1,000 pounds of NOx, it must either buy credits to offset the emissions increase, or demonstrate that it has sufficient credits in its emissions bank.

The rule provides that permits will not be approved for construction or installation of a new or relocated facility unless BACT is applied to every emissions source, and the operation of any emission source will not cause a violation or contribute to an existing violation of state or national ambient air quality standards. The District also will not issue permits unless the facility can demonstrate it holds sufficient RTCs to offset annual emissions for the facility's first year of operation.

Generally, unused RTCs may be sold only during the reconciliation period for the fourth quarter of the applicable compliance year, either the calendar year (Cycle 1, January 1 to December 31) or the fiscal year (Cycle 2, July 1 to June 30). Facilities also can opt to accept a permit condition limiting quarterly emissions, in which case unused RTCs can be sold at the end of each quarter. If emissions are exceeded, RTCs can only be sold following the fourth quarter reconciliation period.

The cornerstone of the RECLAIM program is RTC trading. According to a recent RECLAIM audit report, a total of $863 million in RTCs have been traded since the adoption of RECLAIM, of which $83 million occurred in Calendar Year 2006. There were a total of 730 registered RTC transactions accounting for more than 20,000 tons of credits. In Calendar Year 2006, RTCs were traded by RECLAIM facilities, brokers, commodity traders, private investors, and mutual funds, as well as two foreign entities. Because the price of RTCs now is just above the $15,000 per ton threshold, District staff has just completed a program evaluation and review pursuant to the "Backstop" provisions in Rule 2015(b)(6) and Health and Safety Code §39616(f).

The District Board adopted the report and recommendations at its meeting on September 7, 2007. As recommended by District staff, the Board Resolution states that changes to Rule 2004(d)(1)-(4) (Prohibition of Emissions in Excess of Annual Allocation) are not required. The report recommended changes in reporting and prices for infinite year blocks (IYB) of RTCs. District staff has revised the RECLAIM trading forms accordingly. In addition, the

Board set the predetermined program review price thresholds for IYB trades at fifteen times the predetermined levels previously set at the time of adoption of the RECLAIM program for discrete-year trades ($25,000 per ton of NOx RTCs and $18,000 per ton of SOx RTCs in 1994 dollars). The review price may be adjusted annually based on changes in the consumer price index.[18]

The most recent audit of the RECLAIM program is for Compliance Year 2005. Among other things, the audit is required to assess emissions reductions, per capita exposure to air pollution, facilities permanently ceasing operation of all sources; job impacts, average annual price of each type of RTC, availability of RTCs, NSR permitting, and compliance issues. According to the audit report, total NOx emissions were 23 percent less than the NOx allocations for Compliance Year 2005. The same is true for SOx emissions, which were 16 percent less than allocations for Compliance Year 2005. An important aspect of the RECLAIM program is compliance. The latest audit report also found that over 98 percent of the RECLAIM facilities were in compliance with their allocations during the 2005 compliance year. For those facilities not in compliance, exceedances reportedly were the result of failing to obtain sufficient RTCs to reconcile with its emissions.

Applying RECLAIM's Lessons To AB 32

California faces difficult challenges to implement a system to fully duplicate other successful cap and trade models such as for the Clean Air Act's Title IV program for sulfur dioxide or the South Coast RECLAIM program. CO_2 – unlike those the pollutants involved in other trading schemes – is not a criteria pollutant for which ambient air quality standards have been set. In those other schemes, existing baseline emission limits are already in place as part of initial facility air permitting. Relatively few facilities are required by existing permit now to estimate, measure or record CO_2 emissions by means of approved verifiable test methods that are comparable across many different industrial processes. This lack of test method and monitoring obligation may be an obstacle to verifying the enforceability of a GHG cap and trade program across different sectors that may calculate their GHG using incompatible methodology. Other cap and trade programs are for relatively closed systems of participants that are either geographically close or bound together by identical well known processes.

The RECLAIM program has experienced both successes and shortcomings. That experience with emission trading provides insight into how to design and implement the AB 32 trading program to cap and trade GHG emissions. On the positive side, RECLAIM has been effective in reducing overall air emissions. Since its inception over 14 years ago, NOx emissions in the Los Angeles Basin have been reduced by over 60 percent. For example, the power producing facilities in the District have reduced their emissions, from three tons of NOx for each kilowatt hour (kWh) of electricity generated, to only 1 ton of NOx for every 7 kWh of electricity.

Tradability of Carbon Credits. Any market-based program implemented in California will have implications for programs elsewhere in this country and beyond. There are significant constraints in developing such a program: (a) geographic and (b) attributes necessary for enforceable and verifiable system to allow for the cross-tradability of emission credits.

[18] See http://www.aqmd.gov/hb/2007/September/070943a.html.

California's experience with a cap-and-trade program is solely with RECLAIM, which was designed for a single air basin in California. Although AB 32 is focused initially on reducing GHGs in California, it seeks to contribute to GHG emissions reductions on a global basis. The complexity is far greater to design such a program that will be able to link not only all of California, but one with the potential to link with other programs on a regional, national or even international level.

In a market-based system, the maximum flexibility is obtained if carbon credits can be traded anywhere in the world. The challenge to such trading is to ensuring that these carbon credits have the same "value." The statutory scheme of AB 32 suggests that ARB will be strict in evaluating the equivalency of credits issued under other trading programs; credits to reduce a ton of GHGs in Ohio will need to be the same as credits to reduce GHGs in France. The feasibility of global trading will hinge on the ability to verify that the baselines and allocations used in developing the tradable credits are the same. If a market-based trading program is to have any universal utility, it must be easily synchronized anywhere in the world.

Adequate Time to Establish and Implement the Program. There is doubt whether AB 32 has provided sufficient time to develop and implement an emission trading program. The statute only provides three years to develop a plan and adoption of final regulations. RECLAIM had a tremendous advantage in this regard as there already were existing regulatory requirements in place when RECLAIM was first proposed. Indeed, District rules had been in place for decades when RECLAIM began. There is no such regulatory scheme for GHG emissions. AB 32 will be creating everything for the first time—and ARB staff will have only around three years to design a trading program and develop implementing regulations. Moreover, under RECLAIM, the District committed far more staff time and resources that it had anticipated. ARB will need to devote sufficient resources from the beginning to sidestep the problems the District encountered in the early years of RECLAIM.

RECLAIM also involved different technology and access to that technology. RECLAIM was designed to meet Best Available Retrofit Control Technology for a relatively small number of sources. A market-based program implementing the requirements of AB 32, on the other hand, must mitigate climate change from a much larger and more diverse range of sources. Whether there is adequate technology to achieve the reductions that will be required under AB 32 will depend upon the success of "technology forcing" provisions of the statute.

Another consideration is that from a business perspective, most companies require long-range planning with respect to environmental improvements. A sudden rule change that requires a reduction in emissions often leaves business struggling to respond, largely due to the often long lead time to arrange for purchase and installation of control equipment. It will be important to closely monitor facility operations so there will be sufficient time to make changes when new requirements are being implemented. Command-and-control requirements might be used as a means of ensuring compliance when facilities are unable to meet new requirements. Alternative emissions reduction sources also may be an option, although precisely what this would entail is not clear. What is clear is that the ARB must get it right, and must do so the first time.

Enforcement and Verification. An important aspect of RECLAIM was to establish and inventory a uniform set of accurate emissions data. Accurate reporting of emissions is a key

aspect of any cap-and-trade system. Much of RECLAIM's enforcement efforts are based on this information. In addition, under RECLAIM most of the emissions for a facility were required to pass through a continuous emissions monitoring system (CEMS). This resulted in unanticipated costs each facility had to address. Facilities also had to invest in employee training programs to ensure emissions were accurately reported. Early on there were frequent human and equipment failures which resulted in inaccurate emissions reporting. In addition, District staff previously had monitored emissions only during site visits. RECLAIM required comprehensive audits of data submitted to the District each day by those facilities.

For enforcement to be both consistent and fair, it is essential for there to be clarity in the rules. In addition, field staff must consistently apply regulatory requirements during facility audits. There are significant technological and enforcement challenges in GHG monitoring and reporting to be overcome, so that there will be uniform emission monitoring across all regulated sectors. In the early years of RECLAIM, such uniform monitoring did not exist which resulted in inaccurate emissions reporting. It also will be important to have continual training of staff to ensure that information regarding regulatory and technical requirements is provided in a timely manner.

Baseline Emissions and Allocation of Credits. Establishing baseline facility emissions and allocation of credits is a key part of any successful trading program. Allocations will need to reflect actual emission baselines, not facility estimates. Tough enforcement will be a key. In the early years of RECLAIM, the District struggled with these issues. Allocations were based on reported emissions for a peak year, and facilities were allowed to choose a peak year to set initial emissions allocations. Many had to request changes in their peak year and their allocation when actual emissions proved to be greater than originally estimated. In addition, initial RTC allocations were set too high, which allowed many facilities to use credits rather than changing facility operations or updating equipment to reduce emissions and maintain compliance. Avoiding these problems in future market-based systems will require careful monitoring of facilities to ensure they are not relying solely on credits to meet their emissions caps.

In any allocation of those credits, there will be inevitable disputes regarding how those allocations are made, and whether they are based upon accurate emissions data. Most allocation systems result in "placing a thumb" to tip the scale towards a certain industry, or competitor, or a certain technology. Under RECLAIM, District staff spent an inordinate amount of time addressing allocation issues. In many cases, certain industries received significant advantages in terms of how emissions allocations and caps were set. Any allocation methodology must use clear and consistent criteria so both regulators and the regulated community understand the process. In addition, the allocation strategy should also include a process to resolve disputes regarding GHG allocations.

Safety Valve to Moderate Extreme Market Fluctuations. Another key issue is the debate over how to allow for central control in response to the fluctuating price and availability of trading credits in a market based system. For example, under RECLAIM in 2000, the projected emissions and the issued credits allocated to the market participants were designed to be equal. Ideally there would have been no excess credits in 2000. However, the California energy crisis, brought about in part by deregulation and the need to begin using old, out-of-date power plants, resulted in unprecedented demand for NOx credits. Power plants, which had

delayed retrofits because the plants were not operating, now needed to purchase NOx credits in order to produce needed electricity. Over the course of a few months, power plants purchased 67 percent of allowances while having previously been allocated only 14 percent. RTCs not only were extremely scarce, they were virtually unaffordable as the price of credits rose to more than $60,000 per ton for NOx. In essence, the market "froze" and the disruptions required emergency action by the District to modify the RECLAIM system.

In response, RECLAIM currently has provisions in place to review the program and make necessary adjustments to ensure that credits remain affordable. One example is the 22.5 percent across-the-board reduction in RTC allocations (and therefore emissions) for 2007 though 2011. In the event that prices of credits rise above $15,000 per ton of NOx, the District has the ability to slow the reductions starting in 2008 until prices stabilize. Similarly, AB 32 has a safety-valve that authorizes the Governor to delay compliance deadlines in the event of extraordinary circumstances, catastrophic events or threat of significant economic harm.

Thus, credit availability and affordability are not a foregone conclusion under a market based system. Companies must be able to quickly determine whether needed credits are available and at what price. Conversely, credit traders and investors must be able to estimate the value of credits offered. In addition, regulators must be able to react promptly in the event of market fluctuations. As there likely will be many more sources in the mix, it is a daunting task to anticipate and respond to problems, such as another energy crisis, when they arise. Transparency and prompt availability of information will help to ensure the problems encountered by RECLAIM are not repeated.

Controls on Trading of Emission Credits. One of the more dangerous aspects of market-based trading is the lack of sufficient regulation over the market participants. Under RECLAIM, the District is not involved in the actual trading but they process all trades and maintain a registry of all trading activity. Very few trades are conducted directly between RECLAIM facilities. Brokers currently handle most RTC trades, although investors are beginning to get involved as well. Trading participants include RECLAIM facilities, brokers, investors, mutual funds, wholesalers, and foreign traders.

Because brokers are unregulated, there are risks. In RECLAIM, one of the largest RECLAIM brokers engaged in a prolonged, systematic program of fraud. Anne M. Sholtz of Bradbury, Calif., operated a Pasadena-based internet site named Automated Credit Exchange which traded in RECLAIM air emission credits. ACE's fraud was uncovered when it allegedly needed to purchase a large number of credits for a refinery in Southern California, and thereby obtained $12.5 million from another trader/investor. The subsequent bankruptcy of ACE left hundreds of investors and market participants without the credits or trades that ACE had purported to execute on their behalf, with millions of dollars of losses.

Investors now account for more than a third of the volume of RECLAIM trades. Investors are an important part of the picture as they can often provide capital for needed pollution control equipment. Investors have no compliance obligations with respect to the facilities themselves, and there is a risk that they might hold credits for future use. Credit hoarding has the potential to create market fluctuations, including dramatic price increases. Banking of credits, not currently permitted by RECLAIM, will be allowed under AB 32. One

potential benefit of banking is that it could provide time for the market to respond to activity fluctuations that previously have resulted in price spikes. Allowing inter-sector trading, or establishing a mitigation fee program, also should be considered as ways to avoid the problems RECLAIM has faced.

With the emergence of foreign investors into the market, there also are potential jurisdictional issues that may prevent enforcement against those participants. As a result, the RECLAIM program now requires foreign investors to have a representative in California for purposes of serving any legally required notices.

In AB 32's new trading program, it will be important to both regulate the market participants and develop safeguards to protect against credit hoarding. Because credits are viewed as a commodity, it also will be important for investors to have a high level of confidence in that commodity to assure success of the program.

There is significant debate under AB 32 regarding the ownership of credits and whether they should be treated as real property. Doing so would allow credits to be easily traded on international markets. However, credits as property rights would deprive the government of significant flexibility to amend or modify their regulatory programs because of the "vested property rights" obtained by the market participants.

Cap-and-Trade or Command-and-Control? RECLAIM has demonstrated that significant, verifiable emission reductions are possible using a cap-and-trade system, and that they can be achieved at less cost than traditional command-and-control programs. Facilities have increased flexibility to achieve reductions, which can lead to the use of best practices and development of innovative technology. Indeed, one unexpected benefit of RECLAIM is that many facilities over-controlled their emissions in order to avoid coming up against the cap.

It is much less clear whether similar emission reductions would have been achieved using command and control regulations, or whether such regulations would have more quickly achieved the equivalent emissions reductions. Moreover, there is a complex cost benefit analysis when applied to emission trading, and the arguments that such trading reduces the costs of compliance and provides additional flexibility. In the RECLAIM experience, these cost savings appear to have been realized, but to the regulators, the savings may have been by avoided costs of earlier compliance.

One suggested approach is first use command-and-control regulations, followed by the gradual introduction of a market-based system. ARB has previously endorsed this approach. It may be that command-and-control will need to be an option for large sources unable to meet milestones using cap-and-trade, although overlaying a market-based system with command-and-control may not be the best approach. Balancing the needs of both large and small sources also will be important, as small sources often do not have the resources to take advantage of a market system. In addition, rules will need to be based on technologically feasible and cost-effective controls, and they must be easy to understand and enforce.

In addition, it may be necessary to change consumer attitudes and habits, either by mandatory rulemaking or somehow influencing changes in behavior through education. Whether

any of these efforts will meet the goals established by AB 32 may not be clear for some time to come. Promoting new technologies, changing consumer behavior, assuring equity among the regulated community, and adequate backstops or safeguards to protect credits are only some of the challenges ARB will face in developing a market-based method to adequately reduce GHG emissions.

Conclusion

The eyes of the world are on California as its develops its GHG controls and a market-based trading system. Because the development of the GHG inventories, the regulatory tools and the market-mechanisms will have widespread application to other programs, California will be a proving ground for the next progression of GHG regulations both nationally and internationally. The focus for agencies and regulated entities from the legal context will be to look to broad multi-disciplinary expertise to address these issues. The development of new technologies, the sources of new capital and the enactment of new regulatory schemes will all intersect in the effort to regulate GHGs. This makes GHG regulation perhaps the most significant development in the history of environmental law and policy.