

**The Great Green Hope  
California Carbon Trading for Climate Change Improvements**

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**Introduction**

California's Global Warming Solutions Act of 2006 (A.B. 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.<sup>2</sup>

By January 1, 2008, the California Air Resources Board (ARB) is required to establish a statewide GHG emissions cap to target reductions to baseline 1990 levels by 2020 and also must adopt mandatory reporting rules for significant sources of GHGs. ARB must adopt a plan by January 1, 2009 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; equity between regulated entities;

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<sup>2</sup> The Pew Center on Global Climate Change identified over 125 bills introduced this session of Congress. [http://www.pewclimate.org/what\\_s\\_being\\_done/in\\_the\\_congress/110thcongress.cfm](http://www.pewclimate.org/what_s_being_done/in_the_congress/110thcongress.cfm) 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](http://ag.ca.gov/cms_pdfs/press/2007-08-01_LettertoSpeaker.pdf)

electricity reliability; and conformance with other environmental laws. Any adopted regulations also must ensure that low-income communities are not disproportionately affected.<sup>3</sup>

### **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 incentivize 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.<sup>4</sup>

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. Some question 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 lower

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<sup>3</sup> Calif. Health and Safety Code §38500 et seq.

<sup>4</sup> California Health and Safety Code §38505(k).

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.<sup>5</sup>

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. ARB developed 37 separate activities that it estimated could reduce GHG emissions by ~174 million metric (MM) tons of CO<sub>2</sub> equivalent by 2020, along with other ongoing rules.

The early action plan was accepted and endorsed June 21, 2007.<sup>6</sup> 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. The recommendations from other agencies are in addition to those ARB developed, and they are estimated to reduce GHG another 77 MM tons of CO<sub>2</sub> equivalent. Combined the two sets of recommendations are estimated to reduce GHG by more than 250 MM tons. Looking at the most significant emission sectors, ARB reported on August 7, 2007 that GHG emissions were 436 MM tons CO<sub>2</sub> equivalent in 1990 and 497 in 2004, a difference of 60.<sup>7</sup> The CPUC claims:

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<sup>5</sup> 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.

<sup>6</sup> <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](http://www.arb.ca.gov/cc/ccea/meetings/042307workshop/early_action_report.pdf). The recommendations of other agencies are at [http://climatechange.ca.gov/climate\\_action\\_team/reports/2007-04-20\\_CAT\\_REPORT.PDF](http://climatechange.ca.gov/climate_action_team/reports/2007-04-20_CAT_REPORT.PDF).

<sup>7</sup> [http://www.arb.ca.gov/cc/ccei/inventory/tables/rpt\\_inventory\\_ipcc\\_all.pdf](http://www.arb.ca.gov/cc/ccei/inventory/tables/rpt_inventory_ipcc_all.pdf).

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<sub>2</sub> emissions by an estimated 1,640,000 tons ....

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<sub>2</sub> emissions by approximately 4,900,000 tons.

Since 2001 California IOUs have saved over 460 gWhs as a result of their Refrigerator Recycling Program. This has reduced CO<sub>2</sub> 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<sub>2</sub> emissions by over 111,000 million tons [sic].<sup>8</sup>

Of the combined greater than 250 MM tons 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 80% of 1990 levels by the year 2050.

### **ARB's Market Advisory Committee Report on Cap and Trade**

On June 29, 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.<sup>9</sup> In the Committee's view, capping and trading are 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.<sup>10</sup> 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.

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<sup>8</sup> <http://www.cpuc.ca.gov/static/energy/electric/energy+efficiency/r0604010pd.htm>

<sup>9</sup> 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://www.climatechange.ca.gov/documents/2007-06-29\\_MAC\\_FINAL\\_REPORT.PDF](http://www.climatechange.ca.gov/documents/2007-06-29_MAC_FINAL_REPORT.PDF) and <http://www.arb.ca.gov/board/mt/2007/mt072707.txt>

<sup>10</sup> Id. transcript, p. 40.

- 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<sub>2</sub> emissions and for the non- CO<sub>2</sub> greenhouse gases, an emissions-based approach should be adopted where possible, with an upstream approach used for certain high-GWP gases.
- For CO<sub>2</sub> 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 comment 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 August 13, 2007, without yet deciding on a "first-seller" rule, the CPUC filed a preliminary decision asking ARB to adopt rules for power providers and marketers. These rule require the regulated parties to track and report GHG emissions using assigned "relative emission factors" to attribute CO<sub>2</sub> 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.<sup>11</sup> The requirements for marketers would provide ARB

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<sup>11</sup> INTERIM OPINION ON REPORTING AND TRACKING OF GREENHOUSE GAS EMISSIONS IN THE ELECTRICITY SECTOR , CPUC Rulemaking 06-04-009 <http://www.cpuc.ca.gov/EFILE/PD/71375.pdf>. The CPUC will take continued comment on its preliminary decision until August 30, 2007. 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.

with the information it needs if a first-seller approach is adopted. According to the CPUC, the proposal is also designed to minimize 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. 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.<sup>12</sup>

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 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.

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<sup>12</sup> Id. p. 27

- 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.<sup>13</sup> If the utilities meet 100% of the CPUC's energy saving goals, they could be paid roughly \$323 million in extra rate pay; if they meet only 65% of goals, they would be fined \$144 million. Rate payers would benefit in even greater amounts from the efficiencies achieved. The CPUC will likely vote on the proposal in September 2007. 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.<sup>14</sup>

### **California's Existing Cap and Trade System - RECLAIM**

It is unclear to what extent AB 32's market mechanism directive may reliably duplicate existing similar models to set patterns for GHG reduction by cap and trade. 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. At the time 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.

Total emissions from each facility are evaluated, and maximum emissions levels are set. 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.

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<sup>13</sup> <http://www.cpuc.ca.gov/static/energy/electric/energy+efficiency/r0604010pd.htm>

<sup>14</sup> <http://www.cpuc.ca.gov/EFILE/RULINGS/70309.pdf>

Any facility with four or more tons per year of NO<sub>x</sub> or SO<sub>x</sub> emissions is eligible to join RECLAIM voluntarily, unless otherwise exempted by District rules. Approximately 400 facilities participate in the RECLAIM program, mostly in the NO<sub>x</sub> 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 NO<sub>x</sub> and/or SO<sub>x</sub> 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 NO<sub>x</sub>. 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 NO<sub>x</sub> 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 NO<sub>x</sub> and SO<sub>x</sub> 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 NO<sub>x</sub> 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 NO<sub>x</sub>, 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. RTCs are traded by RECLAIM facilities, brokers, commodity traders, private investors, and mutual funds, as well as two foreign entities during Calendar Year 2006. Because the price of RTCs now is just above the \$15,000 per ton threshold, District staff is currently completing a program evaluation and review pursuant to the "Backstop" provisions in Rule 2015(b)(6) and Health and Safety Code §39616(f). A draft report and recommendations are expected shortly.

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 emissions.

## **Conclusion**

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<sub>2</sub> – 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<sub>2</sub> 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.