

**CALIFORNIA AIR RESOURCES BOARD**  
Assembly Bill 32 Technical Stakeholder Working Group Meeting

March 17, 2008  
1:30 p.m. - 5:00 p.m.

Coastal Hearing Room  
2<sup>nd</sup> floor of the California Environmental Protection Agency (CalEPA)  
Headquarters Building  
1001 "I" Street, Sacramento, California

Note: The Coastal Hearing Room at CalEPA Headquarters has limited seating. The meeting will be webcast (<http://www.calepa.ca.gov/broadcast/>) and open to real-time questions via e-mail ([ccplan@arb.ca.gov](mailto:ccplan@arb.ca.gov)).

**AGENDA**

- A. Opening Remarks
- B. Air Resources Board (ARB) Staff Presentation: "Allocation of Allowances in a Potential Greenhouse Gas Cap-and-Trade Program"
- C. Round-Table Discussion on Allocation

If a cap and trade program is implemented:

1. What method should we use to distribute the allowances?
2. How should allowance value be used? And, if the allowance value should be used to ease the costs of regulation for entities, who should receive them and how many allowances should each entity receive?
3. How should allowances be distributed to new entities and how should entities that cease operating in California be treated?
4. How should the methods of distributing allowances in a cap-and-trade program change in future years?

This is the third in an ongoing series of program design technical stakeholder meetings. These meetings are being conducted to provide interested stakeholders the opportunity to provide specific technical input concerning various elements of the program design that may become part of the Assembly Bill (AB) 32 Scoping Plan. The attached white paper is also intended to provide background on the allocation issues that will be discussed, along with a summary of recommendations on this topic from the California Public Utilities Commission/California Energy Commission Joint Proceeding, the Market Advisory Committee, the Economic and Technology Advancement Advisory Committee, and precedents from other greenhouse gas emissions cap-and-trade programs.

Thank you for participating in this public dialog. ARB welcomes varying and diverse points of view from interested stakeholders, on a variety of AB 32 subjects and scenarios.

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**Schedule of AB 32 Economic Analysis and Program Design  
 Stakeholder Technical Work Group Meetings**

(Schedule is subject to change; when updates occur, a revised schedule will be posted at  
<http://www.arb.ca.gov/cc/scopingplan/meetings/meetingstechstake.htm>)

<b>Group</b>	<b>Meeting Topic</b>	<b>Time</b>	<b>Location</b>
Economic Analysis	Inputs and Assumptions for Core Measures and Policy Scenarios	March 17 9 a.m. – 12:30 p.m.	Coastal Hearing Room
Program Design	Allocation of Allowances	March 17 1:30 p.m. – 5 p.m.	Coastal Hearing Room
Program Design	Offsets	April 4 9 a.m. – 12:30 p.m.	Sierra Hearing Room
Economic Analysis	How Offsets are Modeled	April 4 1:30 p.m. – 5:00 p.m.	Sierra Hearing Room
<b>Scenarios Workshop</b>	<b>Results of First Modeling Phase</b>	<b>April 17</b>	<b>Byron Sher Auditorium</b>
Economic Analysis	Non-economic Analysis	April 25 9 a.m. – 12:30 p.m.	Coastal Hearing Room
Program Design	Cost Containment	April 25 1:30 p.m. – 5 p.m.	Coastal Hearing Room
Economic Analysis	Cost Effectiveness	May 5 9 a.m. – 12:30 p.m.	Coastal Hearing Room
Program Design	Enforcement	May 5 1:30 p.m. – 5:00 p.m.	Coastal Hearing Room
Economic Analysis	TBD	June 16 9 a.m. – 12:30 p.m.	Coastal Hearing Room
Program Design	TBD	June 16 1:30 p.m. – 5 p.m.	Coastal Hearing Room

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**FRAMEWORK FOR DISCUSSION**

**Overview**

The March 17, 2008, program design technical stakeholder meeting is designed to provide interested stakeholders the opportunity to provide specific technical input concerning various elements of the program design that may become part of the Assembly Bill (AB) 32 Scoping Plan. This meeting will focus on issues related to the distribution of allowances within a cap-and-trade system. ARB has structured this meeting around four questions related to allocation within a cap-and-trade program.

This meeting is part of ARB's effort to understand how to best design a cap-and-trade system for possible inclusion in the AB 32 Scoping Plan. AB 32 includes specific criteria that ARB must consider before using market-based measures to implement AB 32, and ARB will evaluate a possible cap-and-trade system against those criteria before deciding whether to include such a system in the Scoping Plan.

To establish a basic framework for our discussion today, here are basic definitions for "allowance" and "allocation" within a cap-and-trade program:

**Allowance**

In a cap-and-trade program an "allowance" is a permit to emit a certain amount of pollution; typically in a greenhouse gas (GHG) context this would be equal to one ton of carbon dioxide (CO<sub>2</sub>). The number of allowances issued within a cap-and-trade program equals the total permitted level of emissions and is referred to as the "cap."

**Allocation**

"Allocation" is how the government or program representative distributes the allowances. Each allowance has a value, which depends on the supply of allowances and the demand to emit pollution. In order to achieve emission reductions, the number of allowances issued is reduced over time. These allowances can be distributed by various methods including: auctioning, benchmarking, and grandfathering.

In the stakeholder meeting on March 17, 2008, ARB staff will show a PowerPoint presentation titled: "Allocation of Allowances in a Potential Greenhouse Cap-and-Trade Program," and facilitate a group discussion on four questions regarding how the allowances and their value are distributed in a potential cap-and-trade design:

1. What method should we use to distribute the allowances?
2. How should allowance value be used? And, if the allowance value should be used to ease the costs of regulation for entities, who should receive them and how many allowances should each entity receive?
3. How should allowances be distributed to new entities and how should entities that cease operating in California be treated?
4. How should the methods of distributing allowances in a cap-and-trade program change in future years?

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**KEY QUESTIONS FOR DISCUSSION**

**1. How should the allowances be distributed?**

- **Allowances can be sold, given away for free, or some mix.** When allowances are given away (“freely allocated”), the allowance value is transferred to the recipient of the allowance. If the State sells allowances, using an auction is usually thought to be the fairest and most transparent way. When allowances are auctioned, the allowances are distributed to the winning bidders. The value of the allowances is represented by the money paid to the State, which would then have the opportunity to use the revenue for public benefit.
- **Using free allocation or auction will have very little impact on the market price for allowances.** The market price in both cases will be close to the “marginal abatement cost.” This assumes that the cheapest reductions will be made first, followed by the next-cheapest, until all the necessary reductions have been made. Over time, as the number of available allowances diminishes, the price of each allowance may increase. If an entity can make less-expensive reductions without purchasing or selling an allowance it will. If an entity’s internal reduction opportunities are more expensive, it will purchase allowances from the market rather than reduce its emissions.
- **Entities have the same incentive to reduce their emissions whether allowances are freely allocated or auctioned.** The economic trade-offs between making reductions and holding more allowances will be the same in either case. The decision to make a reduction and sell a freely allocated allowance has the same economic benefit as the decision to make the same reduction to avoid the cost of purchasing an allowance at auction.
- **The direct cost to an entity is different under free allocation or auction systems.** Under a free allocation system, an entity would need to pay either for reductions to make its emissions match its allocation, or for allowances to make up the difference. Under an auction system, the same entity needs to pay for every ton emitted. Take the example of a company that is emitting 100 tons placed in a cap-and-trade system designed to reduce emissions 10 percent. For simplicity, let us assume that allowances cost \$10/ton and this company cannot make emission reductions for less than \$20/ton. In a simple free allocation system, this company would receive 90 allowances and would buy an additional 10 on the market at a cost of \$100. The same company in an auction system would have to pay for an allowance for all 100 tons emitted and would have to pay \$1,000. The economic trade-offs faced by the company, between buying allowances or making reductions, are the same in either case, but the direct cost to the company are very different. If auction revenue were used to soften this difference, for example by providing incentives or subsidies for investments in emission reductions, this difference could be reduced. In addition to the simple difference in costs, the cost of capital may be higher if an entity has to purchase all of its allowances.

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- **The environmental benefit of the emissions cap is not diminished by either free allocation or auction.** However, allowance value can be used to achieve emissions reductions outside the cap-and-trade program, increasing the total environmental benefit. Auction revenues can be used in a variety of ways, as discussed further below.
- **Distributing allowances by free allocation or auction could potentially influence trading in the market.**
  - One concern is that free allocation of all allowances may reduce trading. Especially early in the program, entities might hold on to allowances they could sell to reduce the risk of having to repurchase them at a higher price if circumstances change.
  - Auctioning allowances could more rapidly establish a “liquid” allowance market in which allowances can readily be bought and sold without large changes to the market price for them. However, auctioning could also reduce trading. If auctions were very frequent they might satisfy the needs of allowance buyers without use of a “secondary” market.
  - Some stakeholders have expressed concern that auctioning will increase market volatility. This has not been the experience of the Acid Rain Program, which has held auctions since 1994. Auction prices have largely tracked closely with spot market prices<sup>1</sup>.
  - Commenters to the Western Climate Initiative (WCI) process have also expressed concern that auctions may lead to market manipulation and scarcity of allowances, especially if entities that do not have to surrender allowances for emissions are allowed to participate. If there is a liquid market for allowances, entities will have the choice of purchasing allowances from the spot market or an auction. The price of allowances purchased at auction, or from the market at the time of an auction, is expected to be similar.
  - “Third parties” that are not required to surrender allowances may increase liquidity by being ready sellers or buyers. They may also help entities manage risk, and help smaller regulated entities by acting as brokers.
  - Susceptibility to manipulation is not an inherent feature of auctions, though the potential exists for some market designs. If ARB were to implement an auction it would carefully evaluate design options to avoid susceptibility to manipulation. This concern is also related to market design issues of scope and point of regulation.
  - The Regional Greenhouse Gas Initiative (RGGI) states commissioned a report on auction design<sup>1</sup>. Though ARB does not endorse the report or its findings, many issues of auction design, including the concerns above, are examined in detail.

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<sup>1</sup> Charles Holt, William Shobe, Dallas Burtraw, Karen Palmer, and Jacob Goeree, “Auction Design for Selling CO<sub>2</sub> Emission Allowances Under the Regional Greenhouse Gas Initiative,” Final Report, October 2007. [http://www.coopercenter.org/econ/rggi\\_final\\_report.pdf](http://www.coopercenter.org/econ/rggi_final_report.pdf)

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- **Auctioning may improve “price discovery,” that is, a clear signal to market participants of the value of an allowance.** This may be especially valuable if an auction is held prior to the opening of a market for trading, potentially reducing early volatility and uncertainty.
- **Auctioning provides an inherent recognition of early actions through the avoided cost of purchasing fewer allowances.**

## 2. How should allowance value be used? And, if the allowance value should be used to ease the costs of regulation for entities, who should receive them and how many allowances should each entity receive?

Allowance value can be used in many ways, including use for the public benefit or to ease the cost of regulation. These are just two general categories among many options. For some particular uses it may be easier to transfer the allocation value through free allocation. For other uses it may be easier to auction the allowances and transfer the allowance revenue.

Below are some uses for the public benefit from funds generated from allowances:

- **Reducing costs.** Funding energy efficiency, as well as research, development, and deployment of low-emission technologies, could lower overall costs to consumers and companies. Allowance value could be used to fund programs directly, or create financial incentives for others.
- **Achieving environmental co-benefits.** Criteria and toxic air pollutants create health risks and some communities bear a disproportionate burden from air pollution. Reductions in air pollution would be a public benefit that could come from allowance value.
- **Adapting to climate change.** Climate change will impact natural and human environments. Forecasts of impacts on California include disruptions to water supplies and ecosystems. Allowance value could be used to help the state adapt to the effects of climate change.
- **Assisting workers’ transition.** Regulating greenhouse gas emissions will probably stimulate economic growth in some sectors and may slow growth in others. Worker training programs funded with allowance value can help Californians shift jobs if necessary.
- **Administration of a greenhouse gas program.** Allowance value could be used to fund state efforts to implement AB 32.

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Funds generated from allowances could also be used to help entities or consumers reduce their carbon emissions, or to compensate entities for potential losses in anticipated profits or asset value. This raises many questions about who should be eligible to receive allowance value and how much each entity should receive.

- **The costs of regulation will be spread unevenly across entities and consumers.** Some regulated entities would be able to fully pass the cost of allowances on to consumers. They would suffer little economic harm regardless of the allocation method.
- **In sectors where costs could not be passed on, entities may expect losses of anticipated profits or asset values.** Profit margins may decrease if allowances become an additional cost. Capital assets or facilities with high greenhouse gas emissions may decrease in value if there is reduced demand for them.
- **In sectors where costs would be passed on, free allocation of allowances to entities would create windfall profits.** In one often-cited example, British electrical power generators simultaneously received free allocations of allowances in the European Union Emission Trading Scheme's (EU ETS) greenhouse gas cap-and-trade program and raised rates. Studies have suggested that collectively they received a windfall of over \$1.5 billion per year<sup>2</sup>.
- **When costs can be passed on to consumers, consumers bear the cost of regulation.**
- **In some cases, reducing the cost of compliance by giving allowance value to entities may reduce leakage potential.** "Leakage" refers to a decrease in California production while production and emissions elsewhere increase. The result would be a reduction in economic activity and jobs in California with no net environmental benefit. The potential for leakage is higher in some sectors than others.

If allowance value were used to reduce the costs of compliance, a number of methods can be used to determine how the value should be distributed. "Benchmarking" means distributing value in proportion to product output or fuel input. For example, an entity might receive some value per ton of product or megawatt hours (MWH) of electricity generation<sup>3</sup>. "Grandfathering" refers to distributing allowance value in proportion to an entity's historical emissions. "Economic burden reduction" would attempt to

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<sup>2</sup> IPA Energy Consulting, "Implications of the EU Emissions Trading Scheme for the UK Power Generation Sector," November, 2005.

<http://www.ipaenergy.co.uk/downloads&publications/FINAL%20Report%201867%2011-11-05.pdf>

<sup>3</sup> A revenue-neutral auction is one application of the principle of benchmarking. One example of such a system is Sweden's NO<sub>x</sub> (oxides of nitrogen) program. Each year, power plants are required to purchase NO<sub>x</sub> allowances equal to their emissions. The revenue from the allowances is returned to the power plants in proportion to their energy output. Plants that are more efficient than the average (using NO<sub>x</sub> emissions as the standard) receive a net gain, and those less efficient than the average pay a net penalty. This provides an incentive for every plant to be as efficient as possible. (Christer Ågren, "Emissions Charge Works Well," Acid News, June, 2000.

<http://www.acidrain.org/pages/publications/acidnews/2000/AN2-00.pdf>)

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compensate entities that can not pass costs through to customers, in proportion to losses of anticipated profits and asset values.

- **Benchmarking gives the most value to the most-efficient entities.** It rewards early actions to reduce emissions. Benchmarks may be based on an industry average or best performance, and may be made as specific as desired to incorporate differences in technologies, fuels, and products. They may be updated or remain constant. The more specific benchmarks are made, the higher the administrative and regulatory costs of developing and implementing them will be.
- **Grandfathering gives the most value to the highest emitters.** The highest emitters may require the largest efforts to transition to a cap-and-trade program. However, grandfathering may create or imply a disincentive for early action. The historical basis for grandfathering may be a single year, the average of several years, or a rolling average.
- **Economic burden reduction may be difficult to administer.** In a plenary form it could require predictions of the economic burden to each entity. Those predictions would probably have to incorporate historical emissions data, process information, and data and models of how costs would be passed through to consumers. That information could be unevenly available for different entities and sectors.
- **Different methods could be used for different sectors.** The methods can also be combined, e.g., by compensating entities within a particular sector for their economic burden through grandfathering or benchmarking.
- **Early action could be rewarded with allowance value.** Entities that have demonstrated reductions prior to the initiation of the cap-and-trade program could be eligible for allowance value. This would incentivize early reductions, which would have an environmental benefit of lower cumulative emissions.
- **Rebates, tax reductions, or utility rate relief may help reduce the costs borne by consumers.** Reductions of distortionary taxes such as income taxes may significantly reduce the overall costs to the economy of the cap-and-trade program<sup>4</sup>.

### 3. How should allowances be distributed to new entities and how should entities that cease operating in California be treated?

Entities that are new participants in a cap-and-trade program, including new or expanded facilities, must be able to obtain allowances to meet their regulatory requirements. Even if all allowances are freely allocated, if there is a liquid market, allowances will be available to all participants. If there are concerns that entities will withhold allowances from the market in order to create a competitive disadvantage for

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<sup>4</sup> E.g., Lawrence H. Goulder, "Mitigating the Adverse Impacts of CO<sub>2</sub> Abatement Policies on Energy Intensive Industries," Resources for the Future Discussion Paper 02-22, March, 2002. <http://www.rff.org/documents/RFF-DP-02-22.pdf>

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new entrants, some portion of the allowances to be allocated may be set aside for new entrants. The likelihood of this behavior also depends on design choices on scope and point of regulation. If a significant portion of allowances is auctioned, new entrants will have fair access to allowances.

If any allowances are allocated for free to entities, there could be a perverse incentive for the entities to stop their California operations to sell free allowances on the market. Consideration must be given to negating this incentive. If allowances are fully auctioned, this incentive does not exist.

#### **4. How should the methods of distributing allowances in a cap-and-trade program change in future years?**

Auction and free allocation can be used in combination, as can different methods of allocation. How allowances and allowance value are distributed can change through time.

- At some time entities may be determined to have been fully compensated for anticipated losses in profit or investment value.
- A cap-and-trade program could begin with mostly free allocations and transition to a mix of free allocations and auctions, and over time to a full auction program.
- Administrative challenges to auction or allocation may change with experience and data collection.
- New competitive pressures may increase the potential for leakage in some sectors.
- Benchmarks or historical emissions baselines may be updated.

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**SUMMARY OF EXTERNAL ARB RECOMMENDATIONS AND PRECEDENTS**

**Recommendations to the California Air Resources Board (ARB):**

*California Public Utilities Commission (CPUC)/California Energy Commission (CEC) Joint Proceeding (Note: this summary is based on the proposed decision published on February 8, 2008, and has not been updated to reflect changes made in the decision adopted by the two Commissions on March 12 and 13, 2008.)*

The CPUC and CEC are engaged in a joint proceeding to make recommendations to ARB on policies to reduce greenhouse gas emissions from the electricity and natural gas sectors. On February 8, 2008, they released a proposed decision recommending that the electric sector be part of a multi-sector cap-and-trade program<sup>5</sup>. Regarding allowance value, the CPUC/CEC Joint Proceeding proposed decision recommends some percentage of allowances be auctioned. It argues that free allocation may lead to windfall profits in some cases, and an auction allows for a simple treatment of new entrants. Auctioning also rewards early action as entities will have to purchase fewer allowances. The proposed decision also recommends using some of the proceeds of an auction “to benefit electricity consumers in California in some manner.”

*Market Advisory Committee*

The Market Advisory Committee (MAC) was formed December 20, 2006 by California Secretary for Environmental Protection, Linda Adams, and delivered its report<sup>6</sup> to ARB June 30, 2007. It includes recommendations on many aspects of the design of a cap-and-trade program, including subchapter 6.1 on allowance distribution. The MAC recommends “fundamental objectives of cost-effectiveness, fairness, and simplicity,” and a distribution that “advances the following principles:

- Reduces the cost of the program to consumers, especially low-income consumers.
- Avoids windfall profits where such profits could occur.
- Promotes investment in low-GHG technologies and fuels (including energy efficiency).
- Advances the state’s broader environmental goals by ensuring that environmental benefits accrue to overburdened communities.

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<sup>5</sup> California Public Utilities Commission, “Interim Opinion on Greenhouse Gas Regulatory Strategies,” Rulemaking 06-04-009, February 8, 2008. <http://docs.cpuc.ca.gov/efile/pd/78643.pdf>

<sup>6</sup> Market Advisory Committee, “Recommendations for Designing a Greenhouse Gas Cap-and-Trade System for California,” June 30, 2007. [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)

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- Mitigates economic dislocation caused by competition from firms in uncapped jurisdictions.
- Avoids perverse incentives that discourage or penalize investments in low-GHG technologies and fuels (including energy efficiency).
- Provides transition assistance to displaced workers.
- Helps to ensure market liquidity.”

It further recommends investments in adaptation to climate change and returning some allowance value to the general public. MAC members also recommended full auction, either at the outset or after a transition over time.

#### *Economic and Technology Advancement Advisory Committee (ETAAC)*

The California Global Warming Solutions Act of 2006 (also known as AB 32) required the establishment of the ETAAC, which delivered its final report<sup>7</sup> February 11, 2008. In Section 9 it responds to the MAC recommendations. It recommends using benchmarking over grandfathering to reward early action, stimulate innovation, and send clear price signals. ETAAC considers some auction necessary. It recommends four uses for auction revenues: Investment in, and purchase of, greenhouse gas emissions reductions; allocating funds to California universities for research, development, and deployment of technologies with “potentially high GHG emission reduction value;” incentives that address imperfections or opportunities in the low carbon market; and taking advantage of co-benefits of GHG reduction opportunities in disadvantaged communities. It also suggests reducing distorting taxes or making direct payments to ratepayers, or “assisting communities or industries that are disproportionately affected by climate change or by climate change mitigation.”

ETAAC also recommends the establishment of a California Carbon Trust, funded through auction revenue, the sale of allowances, the general fund, or noncompliance penalties. The Trust would fund reductions in emissions from uncapped sectors, environmental justice goals, and California university research, development, and demonstration of low-emission technologies. The fund is further envisioned to act as a “market maker,” smoothing out volatility in the market by buying allowances when prices drop and selling them if prices rise.

#### **Precedents:**

##### *European Union Emission Trading Scheme (EU ETS)*

The EU ETS was established as part of the European Union member states’ strategy for compliance with the Kyoto Protocol. Trading is planned for three phases: Phase I, which ran from 2005–2007; Phase II, which began January 1, 2008 and runs 2012; and

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<sup>7</sup> Economic and Technology Advancement Advisory Committee, “Economic and Technology Advancement Advisory Committee (ETAAC) Final Report: Technologies and Policies to Consider for Reducing Greenhouse Gas Emissions in California,” February 11, 2008. <http://www.arb.ca.gov/cc/etaac/ETAACFinalReport2-11-08.pdf>

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Phase III, which will run from 2013–2020. In Phases I and II, each country determined its needs for allowances and its allocation plan, subject to approval by the European Commission. Each country was required to allocate at least 95 percent of its allowances for free in Phase I, and 90 percent in Phase II. Based on experience with allocations and trading to date, the recommendations from the European Commission for Phase III include full auctioning for the electricity sector starting in 2013. They also include enhanced auctioning in other sectors, transitioning to full auction by 2020, with possible exceptions for industries facing international competition from countries without curbs on greenhouse gas emissions.

#### *Regional Greenhouse Gas Initiative (RGGI)*

RGGI is a collaboration of ten Northeastern states to create a regional cap-and-trade program for carbon dioxide (CO<sub>2</sub>) emissions from the electricity sector. Trading is scheduled to start in 2009. The RGGI Model Rule, a template for state implementation of the system, requires each state to use at least 25 percent of the allowances for “a consumer benefit or strategic energy purpose.” A majority of the RGGI states have committed to 100 percent auction. Stated uses for auction revenues vary, including energy efficiency, consumer rebates, and investments in renewable electricity generation. The first auction is scheduled for the summer of 2008.

#### *Regional Clean Air Incentives Market (RECLAIM)*

The California South Coast Air Quality Management District established the RECLAIM cap-and-trade program in 1993 to reduce oxides of nitrogen (NO<sub>x</sub>) and sulfur dioxide (SO<sub>2</sub>) pollution. Allowances were freely allocated based on historical emissions.

#### *Acid Rain Program*

The Acid Rain Program is a United States cap-and-trade program for SO<sub>2</sub> emissions from fossil fuel burning electricity generators. It was established by the U.S. Environmental Protection Agency under Title IV of the 1990 Clean Air Act Amendments. Allocations were made for free to regulated entities, based on benchmarked fuel input and historical usage. A reserve of 2.8 percent of allowances is auctioned annually to ensure that new entrants with no free allocation have access to allowances.