

**Senate Select Committee on California Job Creation and Retention**  
**Informational Hearing – August 14, 2012**

**Examination of Economic Impacts of the AB 32 Cap-and-Trade Program**

Today's hearing will examine economic issues that have arisen in connection with the Air Resources Board's implementation of a cap-and-trade program that was authorized pursuant to the provisions of AB 32 (Nunez), known as the Global Warming Solutions Act of 2006. The cap-and-trade program caps the total amount of greenhouse gases<sup>1</sup> emitted from the state's largest emissions sources that comprise roughly 80 percent of the state's total greenhouse gas emissions. Although they are not assigned an individual emissions reduction target, entities that emit at least 25,000 metric tons or more of CO<sub>2</sub> "equivalents" per year are subject to the cap-and-trade regulation and are a "covered entity." When the program is operational, approximately 350 of the state's largest emitters of greenhouse gases will be subject to the regulation, including oil producers, refiners, electricity generators, as well as other large industrial entities. The remaining 20 percent of greenhouse gas emissions come from entities in other economic sectors such as agriculture and forestry. These sectors are not subject to the cap-and-trade rule, and are classified as uncapped sectors.

***The Global Warming Solutions Act of 2006***

In 2006 the Legislature passed AB 32 (Nunez and Pavley),<sup>2</sup> finding among other things that "global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California," and that global warming "will have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry."<sup>3</sup> The Legislature intended this statute to place California "at the forefront of national and international efforts to reduce emissions of greenhouse gases,"<sup>4</sup> and established the goal of reducing greenhouse gas emissions statewide to

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<sup>1</sup> AB 32 defines "greenhouse gases" to include all of the following gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. [Health & Safety Code § 38505 (g)]

<sup>2</sup> (Stats. 2006, Chap. 488). See Health & Safety Code § 38500 et seq.

<sup>3</sup> Health & Safety Code § 38501.

<sup>4</sup> *Id.* at 38501 (c)

1990 levels by the year 2020. AB 32 designates the California Air Resources Board (ARB) as the state agency charged with monitoring and regulating sources of emission of greenhouse gases.

By January 1, 2008, AB 32 directed ARB to adopt regulations to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with this program.<sup>5</sup> By the same date and after receiving public input, the ARB was required to ascertain what the statewide greenhouse emissions level was in 1990, and approve a statewide greenhouse emissions limit that is equivalent to that level, to be achieved by 2020.<sup>6</sup>

**Scoping plan:** Among other things, AB 32 directs ARB to prepare and approve a scoping plan for achieving the maximum technologically feasible and cost-effective reduction in greenhouse gas emissions from sources or categories of sources of greenhouse gases by 2020. The law also requires that regulations developed pursuant to AB 32 minimize so-called emissions “leakage,” which is increases in emissions of greenhouse gases beyond state borders that result from efforts to reduce these emissions within the state.

The Scoping Plan must identify and make recommendations on direct emission reduction measures, alternative compliance mechanisms, market-based compliance mechanisms, and potential monetary and nonmonetary incentives for sources and categories of sources that ARB finds are necessary or desirable to facilitate the achievement of the maximum feasible and cost-effective reductions of greenhouse gas emissions by 2020.<sup>7</sup> The Scoping Plan summarizes the key elements of its recommendations, designed to reduce greenhouse gas emissions to 1990 levels by 2020, as follows:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewable energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing state laws and policies, including California’s clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and

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<sup>5</sup> Health & Safety Code § 38530.

<sup>6</sup> Health & Safety Code § 38550. In December 2007, the ARB set the limit at 427 million metric tons of carbon dioxide equivalent (MMTCO<sub>2</sub>E).

<sup>7</sup> Health & Safety Code § 38561

- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state’s commitment to AB 32 implementation.<sup>8</sup>

**Cap-and-trade:** In order to achieve the goal of reducing greenhouse gas emissions statewide to 1990 levels by 2020, the ARB recently adopted regulations to establish a “cap-and-trade” program that places a “cap” on the aggregate greenhouse gas emissions from entities responsible for roughly 80 percent of the state’s greenhouse gas emissions. The ARB will issue carbon allowances that these entities—known as “covered entities”—will be authorized to buy and sell on the open market.

Cap-and-trade is a market-based approach to reducing pollution. The “cap” creates a limit on the total amount of emissions from a group of regulated sources, and generally imposes no particular emissions limit on any one firm or source. By establishing a declining, firm limit on the total emissions that may be released, a cap-and-trade program guarantees that the covered sources meet predetermined emissions targets. The “trade” aspect of a cap-and-trade program takes into account the fact that, since some companies can reduce polluting emissions more inexpensively than other entities, they may engage in trading any extra permits. Companies that can more efficiently reduce emissions sell credits or allowances to entities that cannot easily afford to reduce emissions. The companies that sell the credits are “rewarded” while those that purchase must pay for their negative impact.

The cap-and-trade regulation sets a declining, statewide cap on the emission of CO<sub>2</sub> and other greenhouse gases. Businesses and other entities included in the program must obtain and surrender to the ARB sufficient allowances to cover their greenhouse gas emissions, with one allowance equaling an authorization to emit up to the potential warming equivalent of 1 metric ton of carbon dioxide (CO<sub>2</sub>e). The cap-and-trade program covers about 350 businesses, representing 600 mostly large industrial facilities

**Allowances:** Entities regulated under the cap-and-trade program receive allowances, either by way of auction, for free, or a combination of both. Each “allowance” grants the covered entity the “right” to emit a ton of greenhouse gas emissions. At specified intervals, regulated businesses must surrender an allowance for each ton of greenhouse gas pollution they release. Over time, the total amount of allowances available to all sources is reduced, which means that overall emissions from those sources must be also reduced. If an individual entity does not need all of the allowances it has in a given period, it may “bank” those allowances to surrender later or sell them to another registered party. The ability to sell allowances to other businesses that need them creates a market price for pollution reductions and an incentive for businesses to achieve the maximum reductions possible at the lowest cost.

Under the ARB program, allowances can be traded among regulated entities and others. Each allowance has a vintage year and can be used to cover emissions emitted on or after that vintage year. Thus, a covered entity can purchase current vintage year allowances and “bank” those

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<sup>8</sup> The Scoping Plan concludes with ARB’s suggestion for additional measures to further reduce emissions beyond 2020 and to keep the state on track to meet the goal established by Governor Schwarzenegger in Executive Order No. S-3-05 of an 80 percent reduction below 1990 greenhouse gas emission levels by the year 2050.

allowances for use in a subsequent year. Allowances are also trackable. Each allowance has a corresponding unique serial number. This serial number allows the allowance to be tracked throughout its trading life. Once an entity surrenders an allowance to ARB to cover reported emissions, it is permanently retired.

The first opportunity for covered entities to obtain allowances will be either through ARB's free allocation plan, or through ARB's allowance auction, which is set to take place later this year. After the initial auction, covered entities will have the opportunity to obtain allowances by buying and selling them in the open market and through subsequent quarterly auctions in order to provide covered entities regular opportunities to purchase additional allowances. In addition, covered entities will be allowed to use a relatively small portion of offset credits to comply with the regulation. These offset credits are derived from greenhouse gas emission reduction projects that are undertaken by emissions sources not subject to the cap-and-trade program's greenhouse gas emissions cap. The ARB intends to phase-in sectors of the economy that are subject to the cap-and-trade regulation and ultimately reduce emissions by reducing the annual limit of allowances.

### ***Potential Economic Impacts of California's Cap-and-Trade Program***

Today the Committee will hear testimony on the economic impacts of the cap-and-trade rule from representatives of "covered entities" that are directly subject to the cap-and-trade rule, as well as from businesses that will be indirectly affected by the AB 32 regulatory scheme.

Two recent studies are predicting severe economic harm in California due to costs associated with these complex AB 32 regulations as they take effect in the next eight years. The estimated costs to state residents will total \$35 billion in 2020, which exceeds California's combined revenue from sales taxes, corporation taxes, insurance taxes, estate taxes, liquor taxes, tobacco taxes and vehicle fees, according to a study prepared for the California Manufacturers & Technology Association. The report concludes that the average family will pay an extra \$2,500 by 2020 due to increased energy prices.<sup>9</sup>

The total cumulative cost to consumers will be \$136 billion by 2020, according to the report. California's gross state product (GSP) will be reduced by \$153 billion, representing a 5.6 percent decrease in the GSP. That is roughly equivalent to California's GSP loss in the great recession from December 2007 to June 2009. In addition, the state will have 262,000 fewer jobs in 2020 than if AB 32 had not been enacted. Total state and local tax revenues will be reduced by more than \$7.4 billion annually in 2020.

These figures in the report are based on an "optimistic" scenario, assuming a lower range for fuel price hikes and a higher range for energy efficiency the reduction in vehicle miles traveled. The actual costs could be much higher: California families could be paying an extra \$4,500 annually, while state and local tax revenue could drop \$39 billion by 2020.

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<sup>9</sup> *The Fiscal and Economic Impact of the California Global Warming Solutions Act of 2006*, Andrew Chang & Company, LLC, June 2012

Under the “optimistic” scenario, California’s local governments will lose \$1.9 billion in revenue by 2020 and face an additional annual cost increase of \$2.3 billion in 2020, according to the report.

Although the state expects to meet its goal of reducing greenhouse gas emissions to 1990 levels by 2020, one-quarter of those reductions “will be due to the economic slowdown resulting from AB 32 and the decrease in transportation fuel consumption due to increased costs and decreased earnings,” the report states.

The outlook for the state is similarly grim in the other report, which the Boston Consulting Group prepared for the Western States Petroleum Association. Its key findings include:

- Gas prices could increase by \$2.70 per gallon in California, depending on the cost of carbon, and the supply of fuels will be reduced by 2015.
- California could lose 28,000-51,000 jobs directly due to refinery closures, including many high-paying skilled manufacturing jobs, as well as indirect job losses due to multiplier effects.
- California could lose up to \$ 4.4 billion of tax revenue per year by 2020.
- There will be a wealth transfer of at least \$3.7 billion *per year* by 2020, from refineries and fuel suppliers to the ARB because of purchasing allowances.
- The state’s greenhouse gas regulations will discourage energy intensive industries from locating in the state, and existing industry will have strong incentives to leave the state.<sup>10</sup>

Some industry observers estimate that the price of gasoline will soon rise by at least a dollar a gallon due to the cumulative direct cost of climate change regulation on California motorists. According to a recent article by ARB Board members Daniel Sperling and Mary Nichols, the upcoming cap-and-trade auction of carbon emission credits will likely raise gasoline prices by another 70 cents a gallon. They noted that 70 cents a gallon is “not enough to motivate oil companies to switch to alternative fuels or to induce consumers to significantly reduce their oil consumption, but it is *still important to establish the principle of placing a price on carbon.*”<sup>11</sup>

**For example:** To illustrate, Air Liquide of El Segundo emits approximately 607,000 tons of CO<sub>2</sub> per year. Assuming a cost of \$30 per ton of CO<sub>2</sub>, the company would have to buy credits in the total amount of \$18 million. The company has another plant in Rodeo, CA that also emits roughly 607,000 tons of CO<sub>2</sub> annually. This means that this single entity would have to pay about \$36 million annually for the “right” to emit CO<sub>2</sub>.

**Low carbon fuel standard:** Although not directly related to the cap-and-trade program that is the subject of this hearing, the AB 32 Low Carbon Fuel Standard (LCFS) requires facilities to use lower carbon intensity fuels by mandating a 1% reduction in carbon intensity by 2013; a 5% reduction by 2017; and a 10% reduction by 2020. It can scarcely be denied that this standard, if

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<sup>10</sup> *Understanding the Impact of AB 32*, Boston Consulting Group, June 19, 2012

<sup>11</sup> *California’s Pioneering Energy Strategy*, Issues Paper, University of Texas/National Academy of Sciences, Daniel Sperling & Mary Nichols, available at <http://www.issues.org/28.2/sperling.html>

implemented, would radically increase costs and disrupt fuel supplies. Another consequence of this LCFS is that only cellulosic ethanol and Brazilian cane ethanol have low enough carbon intensities to reduce the carbon intensity of existing fuels to a significant extent. However, cellulosic ethanol cannot be produced in sufficient commercial quantities with today's technology, and Brazil does not produce enough cane ethanol to meet California's demand at the specified carbon intensity, even if all of it were sent to California. It is estimated that this scenario would require 150% of the current output of ethanol fuel from Brazil. The adverse economic consequences under this scenario would be quite significant.

**Leakage:** In general, the ARB staff are economic impact deniers. ARB estimates that the state will save about \$4.3 billion in health care costs from cleaner air by 2020.<sup>12</sup> A March 2010 study by ARB concluded that AB 32 would reduce California's GSP by just 0.2 percent.

However, in recent months the ARB has contemplated giving away emission allowances for free to companies deemed by the ARB to be at risk of leaving the state when the cap-and-trade program comes into effect. ARB plans to regulate the program, which is designed to reduce anticipated emission "leakage." Under AB 32, "leakage" means "a reduction in emissions of greenhouse gases within the state that is offset by an increase in emissions of greenhouse gases outside the state."<sup>13</sup> In other words, leakage is term describing companies leaving for other jurisdictions after the implementation of environmental regulations.

The ARB plans to begin the cap-and-trade program by the free allocation of 90 percent of CO2 allowances, with 10 percent purchased. Under this new provision, any company ARB considers to be of high, medium or low risk of leaving the state after the introduction of the cap-and-trade program will receive all the allowances they need to comply with the program, free of charge, for the first two years. Those businesses with a medium or low risk of leaving would see their free allowances decline starting in 2015 and thereafter.

### ***Free Allocation of Allowances to Mitigate "Leakage" and Lessen Cap-and-Trade Economic Impacts?***

At the outset, it should be noted that these allowances have value, and that the ARB intends to give many allowances to industries that ARB believes have "transition risk" and "emissions leakage risk."<sup>14</sup> Transition risk means that some industries could lose profitability, thereby preventing them from investing in cost-effective emission reductions. Emissions leakage is the risk that, due to carbon pricing in California, demand for goods will shift to outside California where no carbon pricing exists, that is, the risk that an industry could simply close up shop and move out-of-state in response to cap-and-trade. Industries that have difficulty passing through costs due to interstate competition are most at risk. Giving allowances to these industries for free mitigates these risks.

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<sup>12</sup> Reported in *Green Supply Chain News*

<sup>13</sup> Health & Safety Code § 38505 (j)

<sup>14</sup> *Appendix J: Allowance Allocation*, ARB cap-and-trade program

It should also be noted that, in general, how CO<sub>2</sub> emission allowances are initially distributed does not affect the emissions reductions achieved by a cap-and-trade program. Several types of free allocation exist. Allowances can be given away for free based on participating entities' historical emissions (a method also known as "grandfathering"). Output-based methods of allowance allocation are based on the output of a product in a given sector. For example, allowances might be distributed based on megawatt-hours generated or tons of a product manufactured. Benchmarking, or setting a level of emissions (in the form of allowances) per unit, can be applied based on input or output. Allowance allocations may also be "updated" over time as input, output, or emissions change. In the case of free allowance allocation, it is important to bear in mind that the point of regulation described above, where compliance is demonstrated by submitting allowances, does not necessarily need to be the same point at which allowances are initially distributed.

**Two approaches to free allocation of allowances:** Under one approach, often referred to as *grandfathering*, producers receive a fixed quantity of allowances that is independent of actual operations during the period when regulations are in place. Under this approach, the free allocations effectively provide a one-time payment, but do not change marginal production costs, since producers receive the same quantity of allowances irrespective of their production activities.

With an *updating output-based allocation*, producers receive a quantity of allowances for each unit of output. Because allowances are allocated in proportion to output, the free allocation effectively lowers the cost of complying with the cap-and-trade system. When the quantity of allowances allocated per unit of output is the same for all producers, the supply curve simply shifts horizontally depending upon the size of the allocation. Because of these offsetting effects, profits are similar to levels that would have prevailed absent the policy; moreover, the "windfall" that potentially occurs under grandfathering would not occur because of these offsetting effects.<sup>15</sup>

**Rationale:** Why should allowances be given away for free? According to the Pew Center on Global Climate Change, a system in which regulated sources are given some portion of allowances free of charge is similar in practice to traditional "command and control" environmental regulation that allows sources to emit up to a permitted level for free. This is the case, for example, under the Clean Air Act's new source performance standards. Under the acid rain program of the Clean Air Act (the successful program to control sulfur dioxide emissions that many consider a model for cap-and-trade programs), allowances are distributed for free to emitters based on a combination of historic electricity generation and emission performance benchmarks.

One argument for providing free allowances to regulated entities is that these firms will bear the costs of changing their equipment and practices to comply with new GHG limits. Many argue that the private sector firms facing this constraint will more efficiently allocate resources to achieve the emission reductions at the least cost. To some, charging firms (by way of an initial

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<sup>15</sup> *Economic and Environmental Implications of Allowance Allocation Benchmark Choices*, Appendix A, p. 1, Robert Stavins, Harvard University, & Todd Shatzki, Analysis Group, Inc.

full auction) for an environmental service that they have always used for free would in effect take away a presumed property right with no transition or compensation.

“Free allocation can be used to compensate firms that are especially vulnerable to international competition, specifically those competing with firms in countries or regions without similar climate policies. For example, the chemical, aluminum, and cement industries are often thought to be vulnerable to foreign competition such that domestic price increases may result in additional foreign imports and increased emissions in those regions. Moreover, by helping to ease transition, free allocation can help achieve buy-in of newly regulated firms to a climate change policy.”<sup>16</sup>

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<sup>16</sup> *Options for Allocation of Greenhouse Gas Emission Allowances*, , p.3, Pew Center on Global Climate Change