



Reducing Emissions and Growing the Economy E2's Policies for Implementing a Cap and Trade Program

California is in the process of making history. California was the first state to mandate an economy-wide reduction in greenhouse gas emissions. Consequently, the policies proposed for California to comply with this bold initiative will have impacts throughout the nation as other states and Congress consider their own policies. While the focus of this paper is on California, we believe the general principles will work for other states and for the nation as a whole.

2008 will be a significant year for climate policy in California. By mid-year, the California Air Resources Board will propose a draft package of policies aimed at reducing statewide greenhouse gas emissions to comply with the California Global Warming Solutions Act of 2006 (AB 32). In 2005, Governor Arnold Schwarzenegger committed to reduce California's greenhouse gas emissions 80 percent below 1990 levels by 2050. In 2006, California passed AB 32, the first-in-the-nation cap on statewide greenhouse gas emissions. By requiring California to reduce its emissions to 1990 levels by 2020, the Global Warming Solutions Act is the first step on the path to achieving the 2050 goals and ushering in California's clean energy economy.

Reaching the 2050 goal is made more challenging due to the expected growth in California's population from 36 million in 2006 to 60 million by 2050. The total emissions in 2006 amounted to an average of 14 tons (of CO₂ Equivalent) per person. When factoring in the estimate that population will grow by more than 500,000 each year, the 25-percent reduction goal means emissions will need to drop to 10 tons/person by 2020 and 1.5 tons/person by 2050.

Reducing emissions from 14 tons per person down to 1.5 requires a major transformation – not just incremental improvements. Thus, the 2020 target must be achieved in a way that stimulates technological change and puts California on a path to a near-zero carbon future by 2050. This transformation needs to be done in a way that:

1. Meets the environmental objective of a stable climate;
2. Maximizes economic benefits for California; and
3. Maximizes the co-benefits of cleaner air, water and sustainable use of natural resources.

We can accelerate emission reductions and force the advancement of new technologies with the right combination of policies and incentives. In this article, we describe the policies mechanisms and incentives for the design of a cap and trade program that E2 believes will allow California to reduce greenhouse gas emissions while growing the economy. These policy mechanisms and incentives include a:

- Strong and declining cap;
- Auctioned and tradable permits;
- Limited offsets for compliance; and the
- Development of a California Carbon Trust, the aim of which is to address the market barriers that impede progress of California's climate policy goals.

E2's Policies

I. Broad-based, Declining Cap on Emissions

California has an overall cap on emissions that is split into two major areas of reductions: (1) a statewide emission limit that the state *itself* commits to achieve through a combination of policies and programs e.g. energy efficiency programs, vehicle emission standards and land use planning to reduce vehicle miles traveled and others 2) a cap on high emitting sectors that individual companies within those sectors must meet. While the cap is the major new policy tool, a host of economic and technology policies will also be needed. Many policies and incentives to reduce emissions already exist but will need to be expanded. These include building and appliance efficiency standards, vehicle emission standards, financial incentives for efficiency and renewable energy generation, etc.

The overall goal of a cap is to meet the emission reductions by forcing technology improvements in every sector of the economy. Moving from 14 tons/person to 1.5 tons/person cannot be achieved any other way. Policies that force new and improved technologies have historically been very successful. A recent example of technology change to address a global pollution problem is the elimination of chlorofluorocarbon (CFC) in propellants and refrigerants and their substitution with non-ozone-depleting gases. Policies should be technology-neutral i.e., the state should not mandate particular technology solutions.

Technology-forcing policies have been very effective in California-specific programs. For example, new electric power plants in California now emit 90 percent less ozone-forming nitrogen oxides (NOx) than they did two decades ago. California's greenest new passenger cars emit 99 percent less volatile organic compounds (VOC) and nitrogen oxides than in 1970. In these cases, the state established a maximum allowable amount of pollution per kilowatt-hour of electricity or mile driven that, in turn, forced technical innovation. The state did *not* mandate the specific type of technology to be used to achieve those pollution caps. This philosophy should be applied to CO2 emissions reduction.

The scope of the cap should be as broad as possible, covering all sectors of the economy that have adequate emissions data. The cap needs to cover the major sources of greenhouse gases including electric power generation, natural gas, transportation fuels and major industrial processes including refineries. The design of the cap should minimize leakage (i.e., shifting emissions from California to someplace else) and require that imports of carbon-intensive products be held to the same standards as California-produced versions of the same products.

II. Auctioned and Tradable Allowances

One way to implement a cap is by issuing allowances. An allowance is a right to emit a ton of carbon dioxide-equivalent during a specific time period. While the state can set an overall cap on emissions per sector, it is impossible to predict the exact amount of allowances that a regulated company will use during the time period because one cannot predict the actual volume of production or the exact amount of emission reductions made internally. Companies gain and lose market share to other companies. Thus, there needs to be flexibility for companies under a cap to trade allowances with other companies. This flexibility results in a market for emission allowances and places a value on the right to emit greenhouse gases, commonly referred to as a “price on carbon.” Companies also need flexibility to “bank” allowances that they do not use when they make reductions ahead of when they are needed.

By limiting emissions, a value is created for the right to emit, which becomes increasingly valuable as the cap becomes tighter. The state needs to make sure that the value it is creating by limiting emissions is used to advance the goals of AB 32 and does not become a windfall profit for the regulated companies. The European Union originally issued free allocations that did result in windfall profits as many regulated companies added the value of carbon to their prices - even though they received the allowances for free (see Deutsche Bank Research “[EU emission Trading](#)” for a discussion).

E2 believes that by 2020, all allowances should be auctioned rather than given away. Allowances should be treated as a public asset and the value of allowances should accrue to, and be used in, the public interest i.e., to provide consumer and emission reduction benefits. Allowances should not be grandfathered (i.e. freely distributed to covered emitters based on historical emissions). The Europeans, who have significantly more experience with allowance allocations, have recently come to this same conclusion:

“While the great majority of allowances has been allocated free of charge to installations in the first and second trading periods, the Commission believes that auctioning of allowances should be the basic principle for allocation from the third

phase onwards. This is because auctioning best ensures the efficiency, transparency and simplicity of the system and creates the greatest incentive for investments in a low-carbon economy. It best complies with the “polluter pays principle” and avoids giving windfall profits to certain sectors that have passed on the notional cost of allowances to their customers despite receiving them for free. ... It is estimated that around 60% of the total number of allowances will be auctioned in 2013, and this proportion will increase in later years..” (see [Directive designed to amend the current EU ETS Directive](#))

As an example of value becoming associated with an permit, consider the recent program of issuing carpool lane stickers for hybrid vehicles such as the Toyota Prius. The intention of the program was to promote the purchase of fuel-efficient hybrids by allowing a solo driver to use the car pool lane. The state limited the availability of stickers to the first 85,000 vehicles to apply. That limit was reached in March 2007. Since that time, as an unintended consequence, vehicles with the stickers are worth up to \$4,000 more (see [Carpool sticker adds value to used Priuses in California](#)) because they can easily save 30 minutes or more in driving time during busy commute times. Now, the only way to get a sticker is to buy a used car with one already issued.

III. Limited Offsets for Compliance

Offsets are a mechanism for an individual or company to pay someone else to reduce their emissions instead of reducing their own emissions – presumably because it is either less expensive or the person or company has no way of reducing their own emissions in the same timeframe. There are two potential markets for offsets:

- (1) A market where regulators could allow offsets to be purchased by regulated companies to meet their compliance obligations under a cap;
- (2) A voluntary offsets market for individuals and companies that are not regulated by the cap but want to reduce their carbon footprint.

Offsets for Compliance

Offsets used for compliance must be carefully balanced. We support limiting the use of offsets for compliance. An unlimited use of offsets allows a company to escape making its own improvements and thus negates the 2050 goal of moving us from 14 to 1.5 tons CO₂E/person via forced improvements in technology. However, offsets for compliance could be less expensive or provide more immediate reductions than reductions made internally by a regulated company. Thus, we believe there will be value in allowing a limited use of offsets in the early market and eliminating their use for compliance purposes by 2020.

Voluntary offsets

Voluntary offsets play a very important role for individuals and companies that want to voluntarily reduce their carbon footprint. We believe these individuals and companies should do the following:

- (1) First, use efficiency measures to minimize their energy demand;
- (2) Then, use low-carbon and renewable energy sources where possible; and
- (3) Finally, offset their remaining carbon footprint if economically practical.

There is significant public benefit in promoting voluntary offsets as a final resort as long as those offsets are real – meaning they are verifiable, permanent and additional. “Additional” means that the reductions would not have occurred without the payment. We do not want to pay someone to make changes they should have done as a course of normal, good business. Real, additional offsets, used after all practical efficiency and renewable energy options have been exhausted, can be a valuable way to advance emission reductions.

IV. Create The California Carbon Trust

The California Carbon Trust is a proposed, independent entity that would use the auction proceeds in ways that would (1) address market barriers, (2) encourage the growth of voluntary offsets, (3) supplement funding for reductions in low-income communities and (4) be a “market maker” during the early years of the carbon market (for details see [ETAAC Report Discussion Draft](#), page 2-3).

Address Market Barriers

Market failures occur when price and the market alone do not achieve the intended public outcome. In the case of environmental innovation, which carries with it substantial public benefits, the problem is that the market does not provide sufficient incentives for would-be innovators. Examples include funding for research development and deployment of low- and zero-carbon technologies, funding for early commercialization of new technologies, etc. The private sector under-invests in these areas because the risks are high and the potential rewards are difficult to capture. The Carbon Trust would provide funding, leveraged with private investment, to bring important, new technologies to market that are unlikely to be commercialized otherwise.

Encourage Voluntary offsets

The Carbon Trust would be a buyer of real, verifiable and additional emission reductions within California. The goal would be to stimulate deployment of greenhouse gas emission reduction projects beyond those happening in the compliance market.

Enable Low Income Community Projects

To mitigate the burden on low-income communities, the Carbon Trust would supplement funding for projects that reduce energy consumption, provide renewable energy resources and achieve co-benefits of improved air quality and “green-collar” jobs.

Act as Market Maker

When companies issue stock for the first time, their underwriters serve as a market maker – selling when there is not enough supply to meet demand and buying when there isn’t enough demand to match supply. The goal is to achieve a stable and liquid market during the early months of a new stock.

The same problem is likely to exist in the early years of a new carbon market. By maintaining an inventory of carbon reductions, the Carbon Trust would be a ready buyer to maintain a minimum price and a seller when demand is too large. This role would disappear as the market reached some minimum volume level.

V. The Goal is a More Competitive Energy Market

Some groups argue that the goal of a carbon price is to make energy more expensive so people will have an incentive to consume less. We think the ideal outcome would be a more competitive energy market so that energy **prices by 2020 are less than they would have been without any climate policies.**

Price increases alone will have an unknown effect on consumer behavior. The [average price of a gallon](#) of gasoline has nearly doubled in four years from \$1.61 in January 2004 to \$3.09 in January 2008 - with only minor effects on nationwide consumption.

The expected price of carbon will have a much smaller effect. Each \$1.00 per ton adds 1 cent to the price of gasoline. If we took the January 25th price of carbon in Europe of \$31/ton and added it to U.S. gasoline, it would mean an increase of \$.31/gallon. If it were added to a kilowatt-hour of electricity in California it would mean an increase from 12 cents to 13.1 cents per kilo-watt-hour. These price increases are unlikely to significantly change demand.

Competition in the energy market could have a significant, beneficial effect on long-term prices. For example, all current transportation fuel prices are linked to the price of a barrel of oil. Alternative transportation fuels such as electricity or liquid fuels from biomass (see Innovative Companies climate.e2.org/jsp/controller?cmd=e2c2companies) are not linked to the price of oil and have the potential to compete with gasoline and diesel when oil is at ½

\$45/barrel or more for oil. Electricity pricing is heavily influenced by the price of natural gas. It is possible, although much harder, to create electricity from renewable sources that can compete with the projected wholesale price of electricity from new natural gas generation (for forecast prices, see NREL Economic, Energy and Environmental Benefits of Concentrating Solar Power in California www.nrel.gov/csp/pdfs/39291.pdf).

In the absence of climate policies, there will more demand growth for transportation fuels and electricity and supplies will be more difficult and expensive to find and deliver. Strong climate policies will encourage the development of new fuel sources in sufficient quantities to become serious competitors. Combined with more efficient buildings, appliances and vehicles, aggregate energy demand will decrease and force down prices.

In the short-term, price increases alone may have an inequitable effect on low-income consumers. Increase in the price can be offset by investments in efficiency. Programs will be needed to ease the impact on low-income families. Such programs already exist for electricity but do not exist for transportation fuels.

Summary

The path to a near carbon-free economy by 2050 is achievable. We can accelerate emission reductions and force the advancement of new technologies with the right combination of policies and incentives. The key policies are:

- Strong and declining cap;
- Auctioned and tradable permit;
- Limited offsets for compliance; and the
- Development of a California Carbon Trust.

For More Information

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