



THE BASICS OF CLIMATE CHANGE CAP-AND-TRADE: AN OVERVIEW FOR LOCAL OFFICIALS

Introduction

The cap-and-trade system that is eventually adopted in California will have direct and indirect impacts on local agencies. Thus, many local officials have asked how the system will impact their city or county. Others have requested a primer on cap-and-trade basics so that they can position their agency to participate in California's cap and trade system.

This short briefing paper provides a general overview of the concept of cap-and-trade as it relates to climate change¹ and reducing greenhouse gas emissions. It also offers information about key issues of interest to local officials and suggests resources to learn more.

Although the basic concepts of cap-and-trade are well established, the final design of California's system is still evolving. Many of the issues discussed in this guide, such as what types of actions by local agencies may be eligible for offsets, will be resolved over time. Thus, this guide will be updated as appropriate to reflect key developments in the California or national cap-and-trade program, especially as they relate to local agencies.

Local officials are encouraged to comment on the guide and participate in an online discussion forum about cap-and-trade on the Institute's website at www.ca-ilg.org/capandtrade.

Cap-and-Trade in a Nutshell

The goal of a cap-and-trade system for climate change is to reduce the total amount of greenhouse gas emissions² produced within a region, such as California or the western United States.

The Cap

In general, a cap-and-trade system works by establishing a limit – or “cap” – on the total amount greenhouse gases that can be produced (or emitted). Most systems are designed so that the limit

¹ Climate change, according to the scientific consensus, is caused by greenhouse gases emitted into the atmosphere. Transportation is the largest source of greenhouse gas; electricity generation and natural gas use in buildings are the second largest source. Climate change is addressed both by reducing greenhouse gas emissions and by adapting to the impacts of climate change.

² The most abundant greenhouse gas in the atmosphere contributing to climate change is carbon dioxide. Other greenhouse gases — methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons and perfluorocarbons — have a much higher global warming potential, which means that they are more potent than carbon dioxide. Greenhouse gas emissions are generally referred to in carbon dioxide equivalents, or CO₂e.

decreases over time. The cap covers all major producers of greenhouse gas and each producer is allowed to generate a limited quantity of greenhouse gas emissions.

Those generators covered by a cap-and-trade system receive permits or “allowances” (also sometimes referred to as credits) to emit greenhouse gases. One allowance is equal to one metric ton of carbon dioxide (or carbon dioxide equivalent for non-carbon dioxide greenhouse gases). California is in the process of establishing how the number of allowances will be determined. It is likely to include a combination of a formula adopted through the regulatory process and an auction among those covered by the cap.

Those subject to the cap have several options for using the permits or allowances. They may return the allowance, simply not use it, bank it for future use, or trade or sell it to another entity covered by the cap. This latter option is the “trade” portion of cap-and-trade.

The Trade

Companies covered by the cap may trade (or sell) permits or emissions allowances among themselves. A company, for example, that does not use all of its emissions permits in its manufacturing process can trade its unused allowable credits to another company that is not able to produce its product without exceeding its cap of allowable emissions.

Not a New Concept

Cap and trade is not a new concept. A cap-and-trade system was used successfully in the 1990s as part of amendments to the federal Clean Air Act to reduce acid rain causing emissions produced by power plants. By most accounts, the system achieved 100 percent compliance in reducing sulfur dioxide emissions at a cost lower than anticipated.

Or, put another way, a company that is not able to operate within its greenhouse gas emissions limit can purchase additional emissions allowances from another company that has excess allowances to trade. A cap-and-trade system rewards those companies that are able to reduce their greenhouse gas emissions more effectively than others. The theory is that such a system creates incentives to invest in energy efficiency, change production methods or implement other actions that reduce greenhouse gas emissions.

Depending upon how the California system is organized, credits may be traded directly between sellers and buyers, or through an auction process. It is also possible that sellers and buyers within a region may trade credits, depending upon

how the California and national cap-and-trade systems are designed. For example, as noted below, California is a member of the Western Climate Initiative, which is a regional cap-and-trade system.

Another example of a regional system is the Regional Greenhouse Gas Initiative. It includes ten northeastern and mid-Atlantic states and is the first mandatory, market-based effort in the United States to reduce greenhouse gas emissions.

Generators Covered Under California's System

AB 32³ established the framework for California's cap-and-trade system. Fifty-one percent of the emissions reductions required by AB 32 must come from those generators covered by the cap. Starting in 2012, different types of industrial sectors will be phased in and covered under the cap.

The first phase begins in 2012 and includes:

- Electricity generation, including imports; and
- Large industrial generators of 25,000 metric tons or more of carbon dioxide equivalents, such as refineries, glass manufacturers and cement manufacturers.

The second phase begins in 2015 and includes:

- Industrial fuel combustion at facilities that emit 25,000 metric tons or less of carbon dioxide equivalents, such as certain manufacturing industries that use natural gas; and
- Transportation fuels.

Each phase is expected to be three years in duration (i.e., 2012 to 2014, 2015 to 2017 and 2018 to 2020).

The Concept of Offsets

Although the cap-and-trade system applies to a specific set of generators of greenhouse gas emissions, such as electricity producers and heavy industry, other producers of greenhouse gases have an opportunity to participate in the system through what are called "offsets."

Most experts agree that offsets need to be real, permanent, verifiable, enforceable, quantifiable, and in addition to greenhouse gas reductions that would otherwise occur in a business as usual situation.

In theory, "offsets" are additional carbon dioxide equivalent reductions that are produced by those outside the cap. Generators of greenhouse gas emissions who produce emissions offsets can sell or trade them to greenhouse gas producers covered by the cap. Conversely, a business that is included in the cap but cannot reduce its emissions sufficiently can buy additional "offsets" from an entity not subject to the cap.

The types of emissions reducing actions that will be eligible for "offsets" is not yet clear and will depend upon the methodology (or protocol) established for the activity. For example, it is not yet clear whether energy efficiency retrofits or installation of photovoltaic energy systems will be eligible for "offsets."⁴ This is

³ AB 32, the Global Warming Solutions Act of 2006, establishes a process for California to reduce its statewide greenhouse gas emissions to 1990 levels by 2020.

⁴ Even if alternative energy or energy efficiency activities ultimately are not eligible for offsets they still have value because they reduce greenhouse gas emissions, conserve resources and save money.

because of the requirement that offsets be *in addition* to actions that otherwise would be taken – also referred to as “additionality.” This is the concept that the action producing the offset must be in addition to what the entity would have otherwise done in a business as usual situation. Besides additionality, offsets must be real, permanent, verifiable, enforceable and quantifiable.

Even if certain local agency activities are eligible for offsets, it is not clear yet who would receive the offset. Would it be the agency or business that installs the equipment, the entity that pays for it, or the entity that generates the electricity that is conserved or replaced? These are details that are still under consideration.

In California, the design of the cap-and-trade system limits the total amount of offsets that can be used to 49 percent of the overall emissions reductions required by AB 32. The purpose of limiting the amount of offsets is to maximize opportunities for emissions reductions within the capped sector through technology innovation, increased energy efficiency, use of lower-carbon fuels, or other means.

Currently, offsets are “created” according to methodologies or protocols, similar to accounting standards, for specific sectors or activities. For example, protocols were recently adopted for forestry practices that are eligible for offsets. Methane collected from landfills is another example of an activity for which a protocol will be adopted. The methodologies (or protocols) spell out the technical and record-keeping practices necessary for the emissions reductions to meet all of the attributes for an offset to be “real” (permanent, verifiable, additional, etc).

A theoretical example of an offset could be reductions in energy use by a local agency resulting from installation of solar photovoltaic systems on agency facilities, purchase of development rights by an open space conservancy or city or county, or replacement of a natural gas boiler with a solar hot water system. Remember, however, because California is still developing the cap-and-trade system (including criteria for offsets), it is not yet clear whether these specific types of activities will be eligible for an offset and if so, under what circumstances.

Two Works in Progress

The California System

AB 32 and the AB 32 Scoping Plan layout a timeline for design and implementation of the system. If proposed schedules are met, California’s system will begin in 2012. The California Air Resources Board has established a schedule of public meetings to work through the details of the system.⁵

In addition, California is working closely with six other western states and four Canadian provinces through the Western Climate Initiative⁶ to design a regional cap-and-trade program that can produce greenhouse gas emission reductions within the region at costs lower than could

⁵ Those interested in receiving notification about development of California’s cap-and-trade system can sign up on the Air Resources Board’s listserv at www.arb.ca.gov/cc/capandtrade/capandtrade.htm.

⁶ Western Climate Initiative: www.westernclimateinitiative.org/

be realized through a California-only program. To that end, the Air Resources Board's regulatory development schedule is being coordinated with the Western Climate Initiative timeline for development of a regional cap-and-trade program.

The U.S. Federal System

Legislation pending in Congress to address climate change at the federal level includes cap-and-trade components. Since both the California and federal systems are currently under development, it remains unclear how the two will relate. Some observers note that California would like to persuade the federal government that the California framework is the model upon which the new federal system can be based. In light of California's involvement in the Western Climate Initiative, there may be some validity to this statement.

Issues of Interest to Cities and Counties

Local agencies covered under the cap

With few exceptions, most local agencies are not included under the cap. That is, they are not entities emitting greenhouse gases in sufficient quantities to be included in the cap-and-trade system. The exceptions are local agencies that own and operate electricity systems and some agencies that own and operate wastewater treatment facilities, depending upon the amount of natural gas used.

Local agencies and offsets

In theory, offsets must be:

- Real
- Permanent
- Verifiable
- Enforceable
- Quantifiable
- Additional

The primary cap-and-trade connection with local agencies likely will come from the potential for local agencies to produce offsets. The most important factor in determining the connection will be how the offset system is designed and operated. Key to this will be determining how offsets are calculated and which type of local agency actions that reduce greenhouse gas emissions will meet the criteria for an offset.

As noted previously, one important component of this issue is likely to be the concept that requires that offsets be the result of actions that are beyond "business as usual." Put another way, central to this concept are the criteria used to determine the types of actions a local agency (or any other producer of greenhouse gas emissions) would take regardless of whether a cap-and-trade system existed or those actions that are beyond "business as usual."

For example, local agency investment in energy efficiency retrofits for agency facilities might be eligible for an offset, depending on how "business as usual" is defined. Different types of actions that reduce greenhouse gas emissions, such as installing solar photovoltaic panels on agency buildings or installing a new heating, ventilation and air conditioning system, might be considered differently, based upon the economics of the actions and what constitutes "business as usual."

Similarly, if a local agency installs photovoltaic systems or energy retrofits on an agency building, the question of who pays for the installation may impact who can receive the offset, if the action is even eligible for an offset.⁷

Some experts suggest that likely offsets available to cities and counties might be:

- Landfill gas capture and use;
- Methane digestion, capture and use at sewage treatment plants; or
- Elimination of natural gas boiler systems and replacement with solar hot water systems (such as water for swimming pools, hospital clinics, jails, employee facilities, etc.).

National and Private Forests and Cap-and-Trade

Many local agencies, especially rural counties, include large expanses of publically and privately owned forests within their boundaries. Some local officials have asked whether their agencies can take advantage of the carbon reducing features of the forests (called sequestration) and sell them as offsets.

The simple answer is no, unless the agency itself owns the forest or open space. In general, potential carbon offsets accrue to the owners of the forest or open space, not the local agency. There may, however, be some potential economic development or financial impacts as a result of local agency zoning and land use actions that could make it easier for the forest owner to participate in a cap-and-trade system. However, as of now, these are hypothetical and probably remote options.

The recently adopted methodology for calculating offsets from forestry practices may offer an opportunity for local agencies to create and sell offsets. Local agency tree planting programs that meet the criteria might result in offsets for the local agency. However, determining who will “own” these offsets will likely depend, in part, on the issue of additionality, plus who pays for the tree planting program.

Local Economic Development Opportunities

Depending upon how the cap-and-trade system is designed, it may have potential local economic development opportunities. For example, if a city or county has offsets to sell, it might use those offsets to attract a new business to locate in the community if the business needs the offsets to meet its cap. The local agency’s offsets could be sold to the potential business at a reduced price or given to the company, the same way local agencies offer other financial incentives to spur economic development. Until the design of the system is finalized, however, it is not known

⁷ A related issue for local agencies to consider is the implication of “leasing” roof space to companies wishing to install solar photovoltaic systems on agency roofs. Depending upon the ultimate design of the cap-and-trade system, local agencies may wish to reserve the right to own all or part of the offsets that may accrue for photovoltaic systems owned by another party but using an agency roof.

whether the sale of offsets can be bilateral between the local agency and the business directly or through a centralized trading market.

Conclusion

California and the nation are poised to adopt a cap-and-trade system designed to reduce greenhouse gas emissions. The system will have direct and indirect impacts for local agencies and their efforts to reduce greenhouse gas emissions. Local agencies may have the ability to reduce greenhouse gas emissions in a way that produces offsets for the agency to use. However, until the methodologies to calculate offsets are adopted and criteria for eligibility established, local agencies should proceed with caution before undertaking an action primarily because of its potential to produce an offset.

Local officials wishing to keep abreast of the regulatory developments of California's system are encouraged to monitor and if desired, participate in, the Air Resources Board's regulatory process.

Where to go for more information

Numerous resources are available that provide additional details about cap-and-trade systems. They include the following:

- California Air Resources Board Cap-and-Trade Webpage www.arb.ca.gov/cc/capandtrade/capandtrade.htm
- State of California Climate Portal www.climatechange.ca.gov/cap_and_trade
- U.S. Environmental Protection Agency www.epa.gov/captrade/
- Western Climate Initiative www.westernclimateinitiative.org/
- Regional Greenhouse Gas Initiative www.rggi.org/home
- National Public Radio's Planet Money – "Dude, Where's My Cap-and-Trade Primer?" <http://www.npr.org/templates/story/story.php?storyId=105285865>
- National Public Radio's Morning Edition – "Do Offsets Really Help Reduce Emissions?" www.npr.org/templates/story/story.php?storyId=113781791
- The Climate Action Reserve www.climateactionreserve.org/ (The Climate Action Reserve is a national offsets program working in the U.S. Carbon market. The California Climate Registry operates under the Climate Action Reserve.)
- Forest Protocols (see link at The Climate Action Reserve website noted above)
- For more general climate change resources, see California Climate Action Network www.ca-ilg.org/climatechange