# Chapter 4
# Cap-and-Trade

## Overview

A cap-and-trade system works by setting an overall limit on emissions and either selling or distributing, at no cost, emissions "allowances," or permits to emit pollutants, to regulated entities or sources. These regulated entities must periodically surrender enough allowances to match their reported emissions or face a penalty. In a system that freely grants allowances, those sources that are able to reduce their emissions at a lower cost than the allowance price may do so and then sell those unused allowances to any entity that cannot achieve reductions as cost-effectively. In a system where allowances are initially sold, cost-effective emissions reductions reduce the number of allowances that must be purchased. Either way, cap-and-trade creates a financial incentive for emitters to continually seek out new emission-reducing technologies and cut emissions as much as possible. By creating a market for the allowances, regulated entities have the choice of either purchasing allowances or directly reducing emissions; as a result, resources are directed to the most cost-effective emissions reduction investments. To achieve overall emissions reductions over time, programs gradually lower the emissions "cap" by reducing the total number of available allowances.

Perhaps the best known example of cap-and-trade is the U.S. Environmental Protection Agency (EPA) program to cut acid rain-causing sulfur dioxide ($SO_2$) emissions from power plants. Established under the 1990 Clean Air Act amendments, this program successfully demonstrated the emissions trading concept by achieving dramatic, cost-effective reductions. More recently, the trading approach has been applied to greenhouse gas (GHG) emissions by the European Union (EU)[1] and proposed by several U.S.-based initiatives, including the Northeast Regional Greenhouse Gas Initiative (RGGI),[2] the Western Climate Initiative (WCI),[3] and the Midwestern Regional Greenhouse Gas Reduction Accord.[4]

The Action Team is charged with identifying means by which Florida can fully achieve or surpass the statewide GHG reductions specified in Executive Order 07-127.[5] These recommendations must be guided by an evaluation of the possible consequences to Florida's environment, economy, and society from global climate change. In November 2007, the Action Team issued its Phase 1 Report. The report offered broad policy guidance in key areas for consideration by the Governor and Legislature or further consideration by the Action Team, including a market-based regulatory approach for utility emissions.

[1] http://ec.europa.eu/environment/climat/emission.htm
[2] http://www.rggi.org
[3] http://www.westernclimateinitiative.org
[4] http://www.midwesternaccord.org/
[5] http://www.flclimatechange.us/ewebeditpro/items/O12F15074.pdf

In June 2008, Governor Crist signed House Bill 7135 (HB 7135), a comprehensive energy and climate change package aimed at reducing GHG emissions that included public investment and private-market incentives in alternative and renewable energy technologies. Section 65 of HB 7135 required the Florida Department of Environmental Protection (DEP) to propose rules for the creation of a cap-and-trade regulatory program. This chapter presents the results of the Phase 2 consideration called for in the Phase 1 Report and offers pre-rulemaking guidance to the DEP in response to the requirements of HB 7135.

There is growing expectation that Congress will require a federal cap-and-trade program. By initiating, joining, or developing a state and/or regional cap-and-trade system in the meantime, Florida would be taking an important step toward influencing the outcome of the federal policy debate in the state's favor.

Ultimately the pollution-cutting performance of a cap-and-trade program depends largely on how it is structured. Key design parameters are discussed below.

The cap-and-trade policy is designed and analyzed to work in concert with non-cap-and-trade policies and measures. The integration of other policies reduces compliance costs and eases attainment of both goals and caps. Emissions reductions, costs, and cost-savings from many of these other measures help Florida comply with the cap; and they also serve as a basis for the cap-and-trade modeling. As a result, the expected operation of the cap-and-trade program is integrated with other policies and policy recommendations, and is not presented as a stand-alone program.

## Policy Recommendations and Estimated Impacts

### *Reduction Targets and Time Frames*

Table 4-1-1 shows the schedule for GHG emission reductions pursuant to Executive Order 07-127.

**Table 4-1-1. Schedule for GHG emission reductions**

| Year | GHG Reduction Goal |
|---|---|
| 2017 | 2000 levels |
| 2025 | 1990 levels |
| 2050 | 20% of 1990 levels |

GHG = greenhouse gas.

## *Sector Coverage*

The regulation of GHG emissions should be economy-wide and should commence as soon as possible; however, a cap-and-trade program may apply only to a limited number of sectors. Sector inclusion in the cap-and-trade program should be guided by cost-effectiveness, administrative efficiency, overall reduction potential, experience by other jurisdictions, and whether alternative policies are preferred. The Florida cap-and-trade program should include the electric sector at the beginning. Rulemaking consideration also should be given to:

(1) industrial stationary source emissions;

(2) residential and commercial fuel use;

(3) transportation fuels; and

(4) energy extraction, processing, and transportation.

These sectors may be better candidates for inclusion in a subsequent phase.

The transportation and residential and commercial fuel use sectors could be considered through rulemaking. They have not been included in cap-and-trade programs to date, although WCI has proposed to include them in its program beginning in 2015. Unlike the electricity, energy extraction, and industrial sectors, these two sectors would most likely have to be regulated upstream of the actual point of emissions. The regulated entity in the transportation and residential and commercial fuel use sectors may need to be the fuel distributor or importer. Transportation and residential and commercial fuel use should be studied further and considered for inclusion in a subsequent phase, or they may be better suited for regulation through non-cap-and-trade market mechanisms. While these and other sectors may not be included in the cap-and-trade program or otherwise regulated at the program start, they should be included or otherwise regulated as soon as possible.

Other sectors may need alternative methods of regulation based on the factors listed above. Land development, forestry, agriculture, and waste management are generally not regulated under a cap-and-trade program due to a lack of historical emissions data, difficulty measuring or verifying current emissions, and other reasons. Emissions reduction projects or programs within these sectors may, however, be well-suited to participate in an "offsets" program as described below.

The Action Team recommends that a *de minimis* exemption below, which sources within the regulated sectors, would be exempt from regulation. The threshold for the exemption could vary by sector.

## *Regional Programs*

First and foremost, a strong national cap-and-trade program is the preferred method for achieving substantial reductions in GHGs, and Florida should advocate for a national program. However, as the federal government deliberates on a national program, Florida should join a regional program to advance its GHG reduction goals. Toward that end, Florida should further examine the economics of joining a regional program, but should not join a regional program where analysis indicates that Florida would be disadvantaged.

**Regional Greenhouse Gas Initiative (RGGI) –** Initial analysis indicates that Florida would benefit from joining RGGI. RGGI currently comprises 10 northeastern states and will regulate emissions from fossil fuel–powered electric generation units (EGUs) with a nameplate capacity of 25 megawatts (MW) or greater. Two 100 percent auction-based cap-and-trade scenarios for year 2020 are simulated for Florida joining the RGGI program.[6] The two scenarios correspond to hypothetical allowance prices of $7/tCO2e and $1/tCO2e, respectively. Preliminary modeling indicates that Florida sources would represent slightly less than half of the total electric generation emissions from the 11 states (10 current states plus Florida), and, depending on assumptions used, would mitigate between 70 and 76 MMtCO2e in 2020, with the balance of 75 to 80 MMtCO2e accounted for by allowance purchases. Florida's RGGI sources would expect to see a cost-savings of between $1.5 and $2 billion dollars in 2020 by participating. (Note that any additional savings that might be realized from the recycling of the auction revenues by the government are not included.) Complete modeling results and analysis may be found in Appendix B: Cap-and-Trade. The Action Team recommends that Florida seek "observer status" with RGGI as soon as possible to examine the program in greater detail, closely monitor progress, and prepare for membership if it is desired.

**Western Climate Initiative (WCI) –** Initial analysis indicates that Florida may benefit from joining the cap-and-trade portion of WCI. Further study would be necessary to determine whether participation in the other planned WCI programs (regional low-carbon fuel standard and renewable portfolio standard) would benefit Florida. WCI is currently comprised of seven U.S. states and four Canadian provinces; its proposed cap-and-trade program will cover emissions from multiple sectors representing approximately 90 percent of total regional emissions. The cap-and-trade simulation for Florida joining WCI (based on the WCI proposed program design recommendations released September 23, 2008), covers a much broader range of emission sources than the RGGI simulation (basically all the sectors except the agriculture, forestry, and waste management sectors). The analysis indicates that Florida would be a permit seller in the market. Florida WCI sources would expect to see a cost savings of $191 million in 2020 by participating in the cap-and-trade program as opposed to achieving the same reductions without it. Florida sources would be expected to mitigate 18.46 MMtCO2e *more* than required to meet targets due to the relatively low cost of mitigation and the opportunity to sell

[6] A 100 percent auction is assumed due to limitations in the model resulting from RGGI's low cost mitigation opportunities (see Annex 1 to Appendix B). As a policy matter, the Action Team is neither recommending nor assuming that Florida will use 100-percent auctions as a means of initially distributing allowances.

allowances to other WCI sources. Complete modeling results and analysis are found in Appendix B: Cap-and-Trade. Because WCI is scheduled to begin on January 1, 2012, at the earliest, there is ample opportunity to conduct further economic analysis and possibly observe the early operation of WCI.

The Action Team recommends that Florida seek "observer status" with WCI as soon as possible to examine the program in greater detail, closely monitor progress, and prepare for membership if desired.

These two regional programs may not be mutually exclusive. The Action Team further recommends that Florida explore the economics and potential obstacles, complications, and benefits associated with joining both regional programs.

**Other programs –** Six Midwestern states and Manitoba are currently engaged in a discussion toward the development of a third regional cap-and-trade program. Recently organized, the group expects to release a draft program design in November 2008, so the Action Team was unable to evaluate whether Florida might benefit. Florida should continue to monitor the progress of this program and investigate the Midwestern program as it develops.

At the same time, Florida should reach out to other Southern states to explore collaborating in one or more ways: (1) jointly influence the development of a national cap-and-trade program; (2) explore the potential for multiple Southern states joining one or more regional programs; (3) help address "leakage" issues (see page 4-9); and (4) explore the creation of a Southern regional climate initiative to reduce GHG emissions, stimulate the development of renewable energy sources, reduce dependence on imported fuels, and stimulate the creation of industries specializing in energy efficiency, renewable energy, and carbon mitigation technologies.

Finally, the Action Team strongly recommends that Florida not pursue a "one state" cap-and-trade program.

## *Caps and Goals*

Florida's GHG reduction cap-and-trade program should be designed to achieve the emission reduction goals set forth in Executive Order 07-127. However, as directed in that Executive Order and the recently enacted HB 7135, Florida should evaluate the conditions under which the state could cost-effectively link its trading system to the systems of other states or regions, such as RGGI or WCI. If Florida joins a regional climate initiative, it should accept the regional goal as long as it is consistent with the state's GHG reduction goals. Current modeling indicates that RGGI should bring Florida's electric sector emissions to the state's goals; however, if it does not, additional policies and measures would be required to reduce GHG emissions to meet the state's goals.

## *Flexibility and Cost Containment Mechanisms*

The mechanisms described below contain a brief description followed by the policy recommendation.

- *Offsets*— Regulated sources can comply with the cap-and-trade program in three ways: reduce emissions directly; acquire and surrender allowances sufficient to cover emissions; or invest in qualifying offset projects and surrender offset credits. Offset projects are voluntary and generate revenue for a project owner through the sale of offset credits, which are equivalent to government-issued allowances. Emission reductions from regulated sources are, therefore, not eligible as offset projects; otherwise these reductions would be double-counted (once for the benefit of the regulated source under the cap, and again for the benefit of the offset purchaser). To ensure the integrity of the emissions cap, offset projects should reduce emissions or sequester carbon from uncapped, out-of-sector projects that are recognized by the program as qualifying for allowance credit. In most cases, any emissions included under any cap-and-trade program's cap cannot be reduced and also qualify as an offset credit under any other cap-and-trade program. Offsets provide an incentive for low-cost investments in uncapped emission reductions as an alternative to higher-cost, in-sector reductions, or allowance purchases.

  *Recommendation: The cap-and-trade program should allow offsets without limits; however, the offset program must ensure rigorous quality standards.*

- *Safety Valve*—A safety valve is a program feature designed to limit or moderate the cost of allowances for the purpose of ensuring that the program will not have an unacceptable impact on consumer costs. Safety valves can be as direct and simple as an allowance price cap, or as indirect and complex as the RGGI's stepped expansion of offset opportunities triggered by allowance prices[7]. The safety valve can be used in conjunction with other tools to mitigate price volatility (such as banking and borrowing). It should be noted that hitting the safety valve price cap would effectively convert the cap-and-trade program into a carbon tax at that price.

  *Recommendation: The cap-and-trade program needs appropriate allowance price containment mechanisms, especially in the early years. Further study is needed before the specific mechanisms can be recommended.*

- *Banking*—Banking allows permit holders to withhold unneeded allowances from the market, or from surrender for emissions compliance, without expiration. A banked allowance may be used in any compliance period beyond the issuance period without penalty. Banking is seen as a means of mitigating market volatility by allowing holders to hold allowances (thereby mitigating supply) when prices are low, and to use or sell them (thereby mitigating demand) when prices are high.

[7] The Western Climate Initiative employs banking, offsets and three-year compliance periods to mitigate allowance prices but does not have a "safety valve."

*Recommendation: The cap-and-trade program should allow unlimited banking.*

- *Borrowing*—Borrowing of allowances permits emitters to release excess tons of GHGs in the current compliance period in return for greater reductions in a future compliance period.

  *Recommendation: Borrowing is an important cost containment mechanism and should be allowed, but agreement by the Action Team was not reached on what conditions (e.g., Warner-Lieberman-type limits by emitter, time limits, or interest) should be imposed.*

## *Allowance Distribution*

One of the most difficult issues confronting cap-and-trade program designers is how allowances are initially introduced to the market. The two principal methods are free allocation and auction sale. Free allocation is the method used in the EPA $SO_2$ trading program and was widely used in the first two phases of the EU Emissions Trading Scheme (ETS) program. Meantime, RGGI will auction nearly all of its allowances, and the EU is gradually moving toward greater reliance on auctions.[8] WCI is still deliberating on the issue, although it is likely that a decision on how best to distribute allowances will ultimately rest with participating jurisdictions.

Under a free allocation system, jurisdictions distribute allowances free of charge to regulated entities according to a formula based upon historical emissions, benchmarked emissions (the expected emissions per unit output for a facility with a preferred technological configuration), or on some other basis. Free allocation systems may include equity features such as a "reserve" for new market entrants, to avoid creating a competitive disadvantage. The formula that determines the number of allowances allocated to each source can be challenging to create. Historical emissions are a common approach, but issues such as selecting the time period to use as a basis and various equity adjustments can be difficult to determine. Benchmarking is straightforward in principle but very difficult to achieve in practice.

Under an auction system, allowances are presented to the market by sale at auction. Regulated entities are therefore required to purchase allowances. Revenues are collected by the issuing jurisdiction. Auctioning allowances resolves the "allocation basis" and many equity issues arising from the free allocation method but presents a new set of challenges, including the additional cost imposed on regulated entities and consumers. Emitters in some sectors are able to pass these costs on to their customers, but others are not. The cost passed along to the consumer may be a public policy concern and, in cases where competitive pressure prevents this, the economic impact on the emitter might be a concern. However, these concerns can be addressed by designing the program to be revenue neutral and returning the allowance value from the auction to consumers directly or through programs implemented for their benefit. In addition, there is the question of what the issuing jurisdiction will do with the auction revenues.

[8] On September 25, 2008, RGGI held its first auction, where 100 percent of its allowances were successfully auctioned off at a price of $3.07.

In the free allocation system, there is a concern regarding windfall profits, as happened in some instances in the EU. This can be an issue when the emitter is not price-regulated and can pass along the cost to customers, as can occur with generators in most of the RGGI states. However, in states where generators are price-regulated, such as Florida, through the Public Service Commission rate hearings, the value of the freely allocated allowance can be directed to the benefit of the ratepayer through rate-setting.

Free allocation and auctioning are not mutually exclusive. Programs can distribute some percentage of allowances using one method and then balance with the other. Programs may change the ratio of free allocation to auction distribution over time. Programs also may distribute allowances to different regulated sectors using different methods or a different mix of methods. Programs may even distribute allowances differently among different classes of sources within a sector (whether municipality-owned utilities, cooperative utilities, or investor-owned utilities).

The Action Team was unable to reach a consensus recommendation on the central issue of initial allowance distribution method. By a 13-5 majority,[9] the Action Team recommends that strong consideration be given to auctioning a substantial amount of allowances. The Action Team recognizes that as RGGI and WCI evolve, additional information will become available to DEP and the Legislature to better evaluate the use of auctions at the beginning of the cap-and-trade program and over time.

Those Action Team members who were opposed to this recommendation expressed concern that there has been no Florida-specific analysis of the relative cost to the consumer for allowance distribution by either auction or free-of-charge allocation. Without such information, they argue, any recommendation stating a preference would be premature. Concerns included whether requiring some industries to pay for allowances would put them at a competitive disadvantage. Others were concerned that there was no assurance that revenues from the sale of allowances would be used by the state for related purposes such as those stated below.

Those who supported auctioning pointed out that presentations from representatives of RGGI and the EU ETS had recommended the use of auctioning. Others stated that the revenues generated by the auctions would be needed to finance other key policies and measures proposed by the Action Team. At least one member observed that given the differences among electric utilities in the state, there would be no fair way to allocate allowances among them. The member observed that the formula would likely be the subject of intense lobbying in the Legislature, and, if allowances were distributed on the basis of historical emissions, customers of utilities with historically higher electric rates and cleaner generation would be disadvantaged while those with lower rates and higher emissions would be advantaged. Supporters of the position expressed the belief that auctioning is the most fair distribution method.

[9] The five Action Team members that voted no on this recommendation were: Mayor Rick Baker, Mike Branch, Mark Kaplan, Kathleen Shanahan and Kathy E. Viehe.

By unanimous consent, the Action Team offers the following general recommendations that could guide future policymakers in answering the question of allowance distribution:

Any allowance distribution system needs to be periodically evaluated to determine whether it is working properly and serving the program goals.

- The cap-and-trade program should strive to be revenue-neutral to consumers as much as possible. There are five broad purposes to which allowance value (either the allowances themselves or proceeds from their sale) should be applied. The purposes are not in any priority order:
    - Promote energy efficiency investments,
    - Mitigate impacts on ratepayers and consumers with particular attention to low-income consumers,
    - Accelerate the development and use of emissions mitigation technologies, including renewable or zero-carbon technologies,
    - Mitigate impacts of climate change (for example, fund adaptation strategies), and
    - Protect regulated emitters from competitive disadvantage.

There are a number of other important uses of allowance value which should also be considered, such as stimulating or rewarding investment in carbon emissions abatement technologies, funding program administration, and protecting regulated emitters from economic disadvantage. One member felt strongly that all allowance value should be used to mitigate the program's impact on ratepayers and consumers.

*It is the Action Team's strong recommendation that if any revenues are generated from the sale of allowances, they should never be used to supplement General Revenue to the State of Florida.*

## *Reporting*

The cap-and-trade reporting system should be consistent with any national requirement. Every effort should be made to ensure that regulated entities are required to complete only one report for both state and national efforts. The reporting system should be as broad as possible; a *de minimis* limit may be needed, given administrative and cost concerns.

Mandatory reporting of GHG emissions is legislatively required at both the state and federal levels. Adoption of reporting rules and collection of emissions data should proceed as quickly as possible in advance of the cap-and-trade program. This is necessary to verify the data from sources and sectors where the historical lack of such requirements injects a significant level of uncertainty into historical emissions estimates and future projections.

## *Leakage*

Leakage occurs when, in response to program incentives, utilities choose to either increase out-of region fossil-based power purchases, or investors choose to construct new generation units in unregulated border jurisdictions. In either case, both the environmental benefits and in-state investment are lost. It is noted that in a national program, leakage is not an issue. Leakage can be addressed through careful design of the point-of-regulation, as in the First Jurisdiction Deliverer (FJD) plan in WCI. FJD requires compliance from any generator within the region, plus any entity that imports fossil-based power from outside the WCI region.[10]

Historically, between 1990 and 2005, electricity imports have contributed between 9 percent and 16 percent of total electricity consumption in Florida. Accordingly, it is critical that the cap-and-trade program baseline include these out-of-state sources and their respective changes over time to accurately define the reduction requirements under the current generation mix.

The Action Team believes leakage is a potentially serious concern. Based on the initial analysis, projected 2020 "business as usual" GHG emissions from imports represent 10 percent of total electricity emissions, or 19.2 million metric tons of carbon dioxide equivalent ($MMtCO_2e$). This amount is equal to about one-third of the total electric utility sector emissions reductions required by 2020 to meet the Governor's GHG reduction goals. Further, electricity imports and their associated GHG emissions are expected to increase if Florida's electricity generation sector is subject to a carbon cap and if generation in adjacent states was not subject to a similar requirement.

*The Action Team recommends that leakage must be addressed by any cap-and-trade program or by Florida through other means if a regional cap-and-trade program does not do so.*

## *Trial Period*

The first recommendation in Regional Programs is that there should be a strong federal cap-and-trade program and that Florida should be an advocate for national action. It is recommended that a new national program should incorporate a trial period to facilitate the transition, verify data, and sort out administrative and other details. The trial period should afford greater flexibility to the regulated community than would be otherwise allowed, but it should nonetheless impose enforceable, binding compliance obligations on regulated sources.

The second recommendation under Regional Programs is that Florida should join one or more regional programs. The issue of a trial period in these cases is a matter of regional agreement. Florida should support the trial period requirements of any regional program it might seek to join.

[10] RGGI does not address the issue of leakage within the program design. RGGI recognizes the issue and will monitor inter-regional contracts and purchases to assess whether leakage is occurring. RGGI has indicated that if leakage proves to be a serious issue, action will be taken to address it.