

# Appendix B

## Cap-and-Trade (C&T)

### Summary List of Pending Priority Policy Options for Analysis

Policy No.	Policy Option	GHG Reductions (MMtCO <sub>2</sub> e)			Net Present Value 2009–2025 (Million \$)	Cost-Effectiveness (\$/tCO <sub>2</sub> e)	Level of Support
		2015	2025	Total 2009–2025			
C&T-1	Greenhouse Gas Cap-and-Trade						

GHG = greenhouse gas; MMtCO<sub>2</sub>e = million metric tons of carbon dioxide equivalent; \$/tCO<sub>2</sub>e = dollars per metric ton of carbon dioxide equivalent.

## C&T-1. Greenhouse Gas Cap-and-Trade

### Policy Description

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 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 sell unused allowances to those who 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. By creating a market for the allowances, regulated entities have the choice of either purchasing permits or directly reducing emissions and, 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 sulfur dioxide (SO<sub>2</sub>) emissions from power plants. Established under the 1990 Clean Air Act, this program successfully proved 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)<sup>1</sup> and proposed by several U.S.-based initiatives including the Northeast Regional Greenhouse Gas Initiative (RGGI),<sup>2</sup> and the Western Climate Initiative (WCI).<sup>3</sup>

On July 13, 2007, Governor Charlie Crist signed Executive Order 07-128,<sup>4</sup> which created the Governor’s Action Team on Energy and Climate Change (Action Team). 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.<sup>5</sup> These recommendations need to be guided by an evaluation of the possible consequences to Florida’s environment, economy, and society from global climate change. During 2007, the Action Team issued its Phase I Report. The report offers 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.

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<sup>1</sup> <http://ec.europa.eu/environment/climat/emission.htm>

<sup>2</sup> <http://www.rggi.org>

<sup>3</sup> <http://www.westernclimateinitiative.org>

<sup>4</sup> <http://www.flclimatechange.us/ewebeditpro/items/O12F15075.pdf>

<sup>5</sup> <http://www.flclimatechange.us/ewebeditpro/items/O12F15074.pdf>

On June 25, 2008, Governor Crist signed House Bill 7135 (HB 7135), a comprehensive energy and economic development package aimed at reducing GHG emissions as well as encouraging investment in alternative and renewable energy technologies. Section 65 of the Florida Climate Protection Act (HB 7135) calls for the Florida Department of Environmental Protection (DEP) to propose rules for the creation of a cap-and-trade regulatory program to reduce GHG emissions from major emitters. This policy is the result of the Phase II investigation called for in the Phase I report and offers pre-rulemaking guidance to the DEP in response to the requirements of the Florida Climate Protection Act.

There is growing expectation that Congress will require a federal cap-and-trade program, perhaps during the next administration. 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 potentially influencing the outcome of the federal policy debate in its favor.

## Policy Design

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

**[Do we need a statement explaining the integration of other policies and measures into the C&T program and modeling?]**

## Reduction Targets and Time Frames

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

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

Year	GHG Reduction Goal
2017	2000 levels
2025	1990 levels
2050	80% below 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 should be also 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 also be considered through rulemaking but are not well

understood. 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 over time based on the factors listed above. If forestry, agriculture, and waste management are regulated under the cap-and-trade program, then they could not participate in the offset program.

There should be a de minimis exemption below which sources within the regulated sectors would be exempt from regulation. The threshold of the exemption could vary by sector.

**[Consider other sectors (such as land development) moving forward.]**

## Regional Programs

First and foremost, a strong national cap-and-trade program is the preferred method for addressing the reduction in GHGs, and Florida should advocate for a national program.

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.

Initial analysis indicates that Florida would benefit from joining the Northeast Regional Greenhouse Gas Initiative. 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. **[Insert summary of modeling results here when completed]** Florida should seek “observer” status with RGGI as soon as possible to closely monitor progress and prepare for membership if it is desired.

Initial analysis indicates that Florida may benefit from joining the cap-and-trade portion of the Western Climate Initiative. Further study would be necessary to determine whether participation in the other WCI programs (e.g., regional low-carbon fuel standard and renewable portfolio standard) would benefit Florida. WCI currently comprises seven U.S. states and four Canadian provinces and seeks to regulate emissions from multiple sectors representing approximately 80% of total regional emissions. WCI is still in the process of designing their program so the final program design is not yet known. Analysis is based on the WCI draft program design published in July 2008. **[Insert summary of modeling results here when completed]** Because WCI expects to begin on January 1, 2012, at the earliest, there is ample opportunity to conduct further economic analysis and observe the early operation of WCI.

Florida should seek observer status with WCI as soon as possible to closely monitor progress and prepare for membership if it is desired.

These two regional programs may not be mutually exclusive. Florida should explore the economics and potential obstacles, complications, and benefits associated with joining both.

At the same time, Florida should reach out to the other Southern states in the hope of collaborating with its neighbors to (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, 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, it is strongly recommended that Florida should 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 Order and the recently enacted Florida Climate Protection Act, 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 the RGGI.

If Florida joins a regional climate initiative, Florida 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 goal; however, if it does not, additional policies and measures would be required to reduce GHG emissions to meet the state goal.

### **Flexibility and Cost Containment Mechanisms**

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

- *Offsets*—Offsets are out-of-sector emission reduction or carbon sequestration projects that are recognized by the program as qualifying for allowance credit. By definition, offsets must be measures that are not required by the program and, in most cases, they cannot be required by any emission reduction program. They provide an incentive for low-cost investments in emission reductions as an alternative to higher-cost, in-sector reductions or allowance purchases. **[This section needs to be clarified or expanded.]**

*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 complex and indirect as the RGGI’s stepped expansion of offset opportunities triggered by allowance prices. 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 onto allowances (thereby mitigating supply) when prices are low and to use or sell them (thereby mitigating demand) when prices are high.

*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 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 the 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<sub>2</sub> trading program and was widely used in the first two phases of the EU Emissions Trading Scheme (ETS) program. RGGI will auction nearly 100% of their allowances and the EU is gradually moving in the direction of greater reliance on auctions. WCI is still deliberating on the issue.

Under a free allocation system, issuing 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 provisions (typically a “reserve”) for new market entrants to avoid creating a competitive disadvantage and other equity features. 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 onto 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.

There is also a concern for windfall profits resulting from free allocation, as happened in some instances in the EU. This can be an issue when the emitter is not price regulated but is free to pass the cost along to customers, as is the case among generators in most of the RGGI states. In states where generators are price regulated, such as Florida, 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 the balance with the other. Programs may change the ratio of free allocation/auction distribution over time. Programs 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 (i.e., municipal utilities, co-ops, and investor- owned utilities).

The Cap-and-Trade Technical Work Group (TWG) was not able to reach consensus on the question of allowance distribution. Some members strongly favored the use of auctions for 100% of the allowances while others objected equally strongly to any use of auctions whatsoever. When asked, “Could you support the use of auctioning for allowance distribution to some degree, i.e., from 1% to 100% of all allowances?” the vote was 7 in favor of *some* use of auctioning to 5 opposed to *any* use of auctioning.

Those opposed to any use of auctioning cited negative impacts on ratepayers, including increased electricity rates and equity issues. They stated that auctioning would lead to higher rates by effectively requiring regulated entities to pay twice—once in the auction system to maintain compliance and again to transition their system to achieve emission reductions. They also cited equity issues under an auction system that would disproportionately impact ratepayers of utilities that, in conformance with Florida Public Service Commission requirements to deliver affordable and reliable power, constructed and currently operate a greater proportion of fossil-fuel-fired generating units within their portfolio. One non-utility member stated that international competitive pressure would prevent the company from

passing the allowance cost on to their customers, which would weaken the company in the face of out-of-region competition. Another concern was that small entities such as municipal and cooperative utilities would be a significant disadvantage in the allowance market because, unlike speculators, they must have allowances to legally operate, but because of their size, they may not be able to acquire them.

Those who supported some or exclusive use of auctioning expressed the belief that a properly designed auction would be the fairest method of ensuring that all market players were treated equally. They also cited the general consensus among economists that auctions were probably the most economically efficient means of initially distributing allowances. One utility advocate of 100% auctions indicated that their customers were already paying a higher cost for the clean energy investments they had made in the past, and a typical free allocation system would actually reward utilities offering lower rates that have historically invested in less clean generation. Others who supported auctions pointed to the public benefits that could accrue from returning or reinvesting the auction revenue into consumer price mitigation measures, energy efficiency investments, or the development of new emissions reducing technologies.

The TWG offers the following general recommendations which could guide future policy makers in answering the question of allowance distribution.

Any allowance distribution system would need 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. These are not in any priority order:

- Promote energy efficiency investments,
- Mitigate impacts on ratepayers and consumers with particular attention to low-income consumers,
- Promote renewable or non-carbon technologies,
- Mitigate impacts of climate change (i.e., fund adaptation strategies), and
- Protect regulated emitters from competitive disadvantage.

**[Add “acceleration of development and use of emissions mitigation technologies” statement here.]**

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 our strong recommendation that if any revenues are generated from the sale of allowances they should never be used to supplement general revenues 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 now 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 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.

Historically, between 1990 and 2005, electricity imports have contributed between 9% and 16% 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 changes over time to accurately define the reduction requirements under the current generation mix.

There are divergent viewpoints within the TWG on the potential importance of the leakage issue in Florida. Some members believe leakage may not prove to be a major concern for a Florida cap-and-trade program, largely because of geographic and transmission infrastructure limitations. They believe further study and analysis should be undertaken and, if a program is adopted, leakage should be carefully monitored. Other members believe leakage is a potentially serious concern. Based on the initial analysis, projected 2020 business-as-usual GHG emissions from electricity imports represent approximately 10% of total electricity emissions, or 19.2 million metric tons of carbon dioxide equivalent (MMtCO<sub>2e</sub>). 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 would be expected to increase if Florida's electricity generation sector was subject to a carbon cap and generation in adjacent states was not subject to a similar requirement. It is recommended by all that DEP should further evaluate the issue.

**[The Action Team seems to want leakage addressed up front. Options include program design features - such as consumption vs. production regulation or first jurisdiction deliverer; other options include non-cap and trade policies such as a generation performance standard (GPS) stipulating GHG per MW limits for new power sources.]**

### **Trial Period**

The first recommendations under regional programs are 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 the RGGI, the WCI, or both. The issue of a trial period in these cases is a matter of regional agreement. Florida should support the trial period requirements (or lack of them) of any regional program it might seek to join.

### **Federal Program**

As stated under regional programs, a strong national cap-and-trade program is preferred over a regional approach. However, for the purpose of initiating GHG emissions reductions sooner than would be possible by waiting for federal action, the recommendation is to join one or more regional programs. By having Florida join a regional program now, the state can influence the design and development of regional rules that will likely influence a national program design. Joining a regional program will prepare Florida's regulated sources for the requirements and opportunities presented by a national program.

As noted under Reporting, the early success of any program depends in large part on the quality and reliability of emissions data. Florida and federal reporting requirements should be harmonized to minimize the burden on reporting entities.

Assuming a federal program is enacted subsequent to Florida's participation in one or more regional programs, it is not the intention that the two programs—regional and federal—would impose separate and overlapping requirements on regulated sources. Instead, there should be a planned transition from the regional to the national program allowing for the integration of the regional program into the national one, including data transfer, full recognition of allowance value and offsets, and recognition of emissions reductions and compliance schemes.

### **Grace Period for Retiring Sources (ESD-10)**

The Energy Supply and Demand (ESD) TWG proposed ESD-10, Grace Period for Replacement of Carbon-Intensive Units, which proposed a 5-year exemption from GHG regulation for coal and natural gas generating units slated for replacement by "units with little or no greenhouse gas emissions." It is recommended above that Florida join one or more regional programs,

which may or may not recognize such an exemption. The failure of a regional program to offer such an exemption should not affect the decision to join that program. However, to the extent that it is consistent with any regional program that Florida might want to join, Florida should consider an exemption for certain generating units scheduled for zero or low-carbon replacement under the following conditions:

1. The exemption should be available to all fossil fuel-fired generating units (coal, oil, and natural gas) and comparable fossil-fuel-fired industrial boilers.
2. The exemption should be a transitional measure only for a limited number of years at the start of the program.
3. The failure to successfully retire the exempt plant by the deadline should carry a severe penalty (e.g., 3-to-1 allowance requirements for noncompliance).
4. The specifics, such as eligibility criteria, replacement requirements, exemption duration, and noncompliance penalties, should be developed through rulemaking.

### **Implementation Mechanisms**

As stated above, these recommendations should be reviewed by the DEP and used as a basis for drafting proposed rules in response to the requirements of the Florida Climate Protection Act (HB 7135). Through the rulemaking process, additional program modeling and economic analysis should be performed to more precisely ascertain costs to regulated entities and consumers as well as economic benefits from reduced consumption of fossil fuel and other co-benefits. Pursuant to HB 7135, rulemaking should be completed by the end of 2009, and proposed rules should be presented to the Legislature for ratification in 2010.

The recommendation that Florida become an observer to both the RGGI and WCI regional cap-and-trade programs will provide the state with direct access to the ongoing development and implementation of these programs. This will not only provide better information for assessing whether Florida should join one or both programs, it will also afford Florida the benefit of access to their knowledge and experience as the state begins to develop its own rules.

### **Related Policies/Programs in Place**

All GHG mitigation policies and measures within capped sectors have the potential to affect cap-and-trade program costs and benefits. Related programs include RGGI, WCI, and the Midwestern Regional Greenhouse Gas Reduction Accord created by the Midwestern Governors Association (MGA).

### **Type(s) of GHG Reductions**

This may depend upon the sectors included and the program design. At a minimum, carbon dioxide (CO<sub>2</sub>) will be reduced. However, a multi-sector program, especially one including industrial emissions, could reduce emissions of all six major GHGs.

**Estimated GHG Reductions and Costs or Cost Savings**

TBD by modeling

**Key Uncertainties**

TBD

**Additional Benefits and Costs**

TBD

**Feasibility Issues**

TBD

**Status of Group Approval**

TBD

**Level of Group Support**

TBD

**Barriers to Consensus**

TBD

## Acronyms and Abbreviations

C&T	cap-and-trade
CO <sub>2</sub>	carbon dioxide
DEP	Florida Department of Environmental Protection
EGU	electric generation unit
ESD	Energy Supply and Demand
ETS	Excellence Through Stewardship
EU	European Union
FJD	First Jurisdiction Deliverer
GHG	greenhouse gas
HB 7135	House Bill 7135
RGGI	Regional Greenhouse Gas Initiative
SO <sub>2</sub>	sulfur dioxide
TWG	Technical Work Group
US EPA	U.S. Environmental Protection Agency
WCI	Western Climate Initiative

## Units of Measure

MMtCO <sub>2e</sub>	million metric tons of carbon dioxide equivalent
MW	megawatts