

A Report to Governor Charlie Crist

Phase 1 Report:
Florida's Energy and Climate Change Action Plan
Pursuant to Executive Order 07-128

Governor's Action Team on Energy and
Climate Change

November 1, 2007



TRANSMITTAL LETTER

November 1, 2007

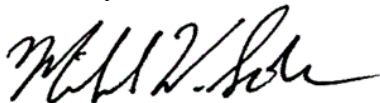
The Honorable Charlie Crist
Governor of Florida
The Capitol
Tallahassee, Florida

Dear Governor Crist:

On behalf of your Action Team on Energy and Climate Change, I am pleased to submit our Phase 1 Report in developing Florida's Energy and Climate Change Action Plan. As directed by Executive Order 07-128, your Action Team has developed findings and recommendations for the 11 issues identified.

This document offers 35 findings and 30 recommendations. We are honored to have the opportunity to serve as your Action Team and look forward to submitting our second and final report October 1, 2008.

On behalf of the Action Team,
Sincerely,



Michael W. Sole
Chairman

GOVERNOR'S ACTION TEAM ON ENERGY AND CLIMATE CHANGE

Michael W. Sole, Chairman

Secretary
Florida Department of Environmental Protection

The Honorable Rick Baker, Vice-Chairman

Mayor
City of St. Petersburg

The Honorable Jeffrey "Jeff" Atwater

Senator
Florida Senate, District 25

The Honorable Al Lawson

Senator
Florida Senate, District 6

The Honorable Dan Gelber

Representative
Florida House of Representatives, District 106

The Honorable Stan Mayfield

Representative
Florida House of Representatives, District 80

Thomas "Tommy" Boroughs

Chairman
Florida Energy Commission
Partner
Holland & Knight

Camille E. Coley, J.D.

Executive Assistant Vice President for Research
Florida Atlantic University

Lisa Polak Edgar

Chairman
Florida Public Service Commission

James M. Fenton, Ph.D.

Director
Florida Solar Energy Center
University of Central Florida

Manley K. Fuller, III

President
Florida Wildlife Federation

David Guest

Managing Attorney
Earthjustice Florida – Tallahassee

Debbie Harrison

Director
World Wildlife Fund – South Florida Program

Lonnie Ingram, Ph.D.

Distinguished Professor of Microbiology and Cell
Science
College of Agriculture
University of Florida

Mark Kaplan

Vice President
Mosaic Fertilizer, LLC

Gerald "Jerry" Karnas

Florida Climate Project Director
Environmental Defense

Jerry Montgomery

Senior Vice President
Conservation and Environmental Sustainability
Walt Disney Parks and Resorts

Armando Olivera

President
Florida Power & Light

Charles Pattison

Executive Director
1000 Friends of Florida

Kathleen Shanahan

Chief Executive Officer
WRS Infrastructure & Environment, Inc.

Jack Shreve

Senior Counsel
Office of Governor Charlie Crist

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EXECUTIVE SUMMARY

In accordance with Executive Order 07-128, the Florida Governor's Action Team on Energy and Climate Change was created to develop a comprehensive Energy and Climate Change Action Plan to guide the state in fully achieving or surpassing the statewide targets for greenhouse gas reductions outlined in the Governor's Executive Order 07-127. This report constitutes the completion of Phase I of that Energy and Climate Change Action Plan.

The report contains the findings and recommendations of the Action Team. These findings and recommendations address the 11 charges outlined in the Governor's Executive Order 07-128, which are each, in turn, framed by the principal energy challenges facing Florida, those being to:

- Stimulate economic development,
- Achieve energy security and
- Address the effects of global climate change.

In organizing their recommendations, the Action Team separated the 11 charges of the Governor into five categories including:

1. The power generation sector
2. The transportation sector
3. The government sector
4. Organizing state government for Florida's energy future, and
5. A blueprint for development of actions.

The Action Team's findings and recommendations were based on presentations and testimony heard on a variety of subjects pertaining to the Governor's charges. Much time was devoted to the potential for structuring a market-based mechanism such as a "cap and trade" program. Recommendations were made to increase energy efficiency and conservation, examine the potential for capture, sequestration and storage of carbon, expand the production of renewable energy, and to further examine of the role of nuclear energy in Florida. The Action Team deferred until next year a recommendation on the precise mechanism for regulating carbon emissions in the state, but did recommend pursuing the design of a market-based policy of cap and trade for tradable emissions credits, establishing linkages with ongoing emissions trading markets, and emissions-reporting by the state's electric utilities to the Climate Registry. The Action Team also recommended that the Department of Environmental Protection examine and propose additional industry sectors for inclusion in mandatory emissions reporting.

The transportation sector was discussed at length and presentations from Florida's Department of Transportation, Department of Community Affairs and the Florida Energy Office highlighted the many state government efforts already underway by those entities. Potential solutions to highway congestion, reductions in vehicle miles traveled (VMT), land-use issues, as well as the carbon characteristics of the available and potential vehicle fuels were presented to the Action Team. The Action Team developed recommendations including the incorporation of emission-reduction strategies into state, regional and local growth and transportation planning, incentives for vehicle miles traveled (VMT) reductions, promotion of efficient public transit systems and low carbon vehicles. The Action Team also recommended continued provision of existing incentives for research and development of new fuels as well as promoting life cycle analyses for fuels in order to comprehend their full impact on the state's resources and environment. The Action Team deferred until 2008 a full examination of a low carbon fuel standard and the potential for establishing a regional fuel standard with other southern states.

State government operations and facilities and their greenhouse gas emissions were addressed in the Governor's Executive Order 07-126, but the Action Team was charged with recommending further energy and emissions savings in this report. Presentations and information were given to the Action Team in this regard and this report includes recommendations to, among other things, extend by statute the executive branch actions contained in the Governor's Executive Order to all other state government operations. Additionally, the Action Team recommended removing any barriers to the use of energy performance savings contracts for state government facilities and providing incentives to assist local governments in achieving green building or similar standards.

The Action Team examined the state's roles in policy, energy regulation, program implementation, research and market development, and recommended that the state foster greater public/private cooperation with universities and other research centers to develop a low carbon and alternative energy/technology market in Florida.

In composing a blueprint for Florida's final Climate Action Plan, the Action Team sees a need to develop a facilitated stakeholder process using an outside consultant, yet managed by the Action Team, which would address in much greater detail the key issues identified in this report. For the Action Team's October 1, 2008, deliverable there are six new charges. The Action Team believes it is necessary to thoroughly examine the opportunities available, not just in Florida but also with regard to linkages to other states and regions.

INTRODUCTION

On July 12 and 13, 2007, Governor Charlie Crist hosted "Serve to Preserve: A Florida Summit on Global Climate Change." The summit brought together leaders of business, government, science and advocacy to examine the risks of global climate change to Florida and the nation, and to explore the business opportunities that can come from an aggressive response to climate change. At the conclusion of the summit in Miami, Governor Crist signed three Executive Orders and two international partnership agreements, vaulting Florida to the vanguard of states actively working to address global climate change.

Executive Order 07-126 directed state government to lead by example by quantifying operational emissions and meeting specific reduction targets; implementing a range of greenhouse gas emission reduction efforts that impact state government facilities and vehicle fleets; and using the purchasing power of state government to promote energy efficiency and reduced emissions.

Executive Order 07-127 established reduction targets for the emissions of greenhouse gases in Florida as follows:

- By 2017 – reduce greenhouse gas emissions to 2000 levels;
- By 2025 – reduce greenhouse gas emissions to 1990 levels; and
- By 2050 – reduce greenhouse gas emissions by 80 percent of 1990 levels.

As first steps toward meeting these targets, the Executive Order directed the Florida Department of Environmental Protection (DEP) to set maximum allowable emissions levels of greenhouse gases for electric utilities; adopt the California motor vehicle emission standards upon approval by the U.S. Environmental Protection Agency of the pending waiver; and adopt a statewide diesel engine idle reduction standard.

The Executive Order further directed a 15 percent increase in the energy efficiency performance of the 2007 Florida Energy Code for Building Construction as well as a 15 percent increase by 2009 in the energy efficiency of certain appliances sold in Florida. Finally, it requested that the Florida Public Service Commission adopt a 20 percent Renewable Portfolio Standard with a strong focus on solar and wind energy; adopt the Institute of Electrical and Electronics Engineers (IEEE) Standard 1547 for Interconnecting Distributed Resources with Electric Power Systems; and require net metering for on-site renewable technologies of up to one megawatt in capacity.

Executive Order 07-128 established the Governor's Action Team on Energy and Climate Change and tasked it with creating a comprehensive Florida Energy and Climate

Change Action Plan to achieve or surpass the statewide targets for greenhouse gas reduction specified in Executive Order 07-127.

To accomplish these goals, the Florida Energy and Climate Change Action Plan is guided by an evaluation of the possible consequences to Florida's environment, economy, and society from global climate change and offers policy recommendations and necessary changes to existing law. Executive Order 07-128 provided the Action Team with two phases for submitting recommendations. The first phase directed the Action Team to provide recommendations by November 1, 2007, on:

1. Strategies and mechanisms for the consolidation and coordination of energy policy in Florida;
2. Additional greenhouse gas emission reduction strategies beyond those directed in Executive Order 07-127, as well as an overall blueprint for development of actions;
3. Policies to enhance energy efficiency and conservation, including statewide targets;
4. Market-based regulatory mechanisms, such as cap and trade programs, for use in efficiently reducing greenhouse gas emissions;
5. Strategies to diversify Florida's electric generation fuels to reduce greenhouse gas emissions and protect Florida's consumers from fuel price volatility;
6. Policies for emission reporting and registry that measure and document emission reductions;
7. Strategies for reducing the greenhouse gas emissions from motor vehicles;
8. Strategies for increasing the amount of renewable transportation fuels and for reducing the carbon content of fuels, such as a low carbon fuel standard;
9. Policies not addressed in Executive Order 07-126 to reduce greenhouse gas emissions from state and local governments;
10. Policies to reward early emission reductions in advance of statewide or national greenhouse gas regulatory programs; and
11. Other policies for efficiently reducing emissions in Florida in conjunction with, or independent of regional, national, or international agreements.

The Action Team was charged with providing additional policy recommendations by October 1, 2008. Accordingly, those issues are not addressed in this report.

On August 13, 2007, Governor Crist appointed 21 members to the Action Team and selected Florida Department of Environmental Protection Secretary Michael Sole as Chairman and Mayor Rick Baker of the City of St. Petersburg as Vice Chairman.

To meet the first deadline set by Executive Order 07-128, the Action Team met four times during the late summer and fall months of 2007 in more than 36 hours of hearings.

The Action Team listened to presentations from international, national, and Florida-based experts, and dozens of members of the public and other stakeholders.

This document provides background information on Florida's major energy and climate change challenges before moving on to detail the findings and recommendations of the Governor's Action Team on Energy and Climate Change.

BACKGROUND: FLORIDA'S ENERGY CHALLENGES

Florida was settled and developed by people with unbounded optimism and great faith in the future. This is still true. The challenges we have today give birth to opportunities for tomorrow. To seize these opportunities is the reason Governor Crist established and charged this Action Team. With our future in mind, the Action Team has concluded that Florida should act now to reduce greenhouse gas emissions and encourage the development of alternative energies for purposes of:

1. stimulating economic development in our state associated with the existing and emerging alternative energy industries;
2. achieving energy security by reducing our dependence on foreign fuels; and
3. addressing potential impacts on Florida from climate change.

Few single elements have as much economic impact, and are as critical to economic strength, as energy. Whether it is the electricity to run homes or businesses or the petroleum to power transportation systems, energy is the lifeblood of the economy. Due to the economic importance, the primary goals of Florida's energy policy must be to ensure a clean, reliable, fair and affordable energy supply.

Stimulating Economic Development

Efforts to address energy security and global climate change are creating new markets for products and services that did not exist 20 years ago. Efforts to reduce national reliance on foreign sources of energy are giving rise to an increasingly robust biofuels industry. Market-based regulatory programs for reducing GHG emissions are creating opportunities for agriculture to sell the carbon storage services of lands under cultivation. Underlying both issues is the research and development of new technologies by leading institutions worldwide. Energy security and global climate change are reordering the global economy. By embracing this market transformation, Florida will be better positioned to prosper.

In order to address Florida's energy future, the state and the private sector must invest in new fuel sources, new technologies, new infrastructure, more efficient appliances, and more efficient vehicles. These investments represent real business opportunities.

Governor Crist has pointed out repeatedly that there are many opportunities that can be created by new economic ventures in Florida. If Florida is successful in launching biomass, solar, wind, and ocean energy programs, it will be poised to provide other states and South and Central America with the technologies, expertise, and manufactured parts to take advantage of Florida's renewables industry. Governor Crist has often said that "there is gold in green" for Florida in advanced energy technologies. Entrepreneurs and businesses have the opportunity to invest in new technologies and

build a strong alternative energy market while helping to strengthen Florida's energy future.

Evidence of the economic opportunities in alternative fuels is offered by the success of the Farm to Fuel program at the Florida Department of Agriculture and Consumer Services (DACCS). In 2006, Agriculture Commissioner Charles Bronson hosted the first Farm to Fuel summit to bring 200 Florida farmers and university researchers together with investors and businesses. One year later, attendance at the summit more than doubled.

Businesses and investors are keenly interested in the new opportunities. At the national level, venture capitalists sank \$740 million into biofuel firms in 2006, compared to \$111 million in 2005.¹ The broader advanced energy technology sector attracted \$2.9 billion in venture capital in 2006, outstripping even FY2008 federal appropriations of \$2.7 billion.²

Investors in alternative energy sources have a unique opportunity as the industry develops in Florida. However, for that to happen, government must send clear signals to the marketplace that it is making a firm commitment to encouraging these energy sources. Florida's universities and scientists have made the commitment and they are hard at work developing the next generation of technologies that will lead to Florida's energy future.

Achieving Energy Security

More than half of the oil consumed by the United States is imported and 44 percent of those imports come from the Organization of the Petroleum Exporting Countries (OPEC). Projected trends by the United States Department of Energy show dependence on oil imports continuing to increase. In May of 2001, the National Energy Policy Development Group concluded that this imbalance, "...if allowed to continue, will inevitably undermine our economy, our standard of living and our national security." Geopolitical challenges are driving the United States to focus on energy security by increasing the domestic production of energy rather than depending on foreign nations.

The achievement of energy security in the United States has focused on five main objectives:

1. Increase the energy efficiency of automobiles, appliances, buildings, power plants, and transmission lines;
2. Modernize energy infrastructure by adding new transmission facilities, retiring old generators that release high emissions, and investing in public transportation;

¹ Cleantech Venture Network

² "Envy with Green(tech)," TeleSoft Partners. 2007

3. Diversify the fuels used in the electric and transportation sectors;
4. Develop cleaner domestic fuels; and
5. Invest in and encourage alternative and new technologies.

Florida also is looking to achieve those same objectives on a state level. Coal is delivered by rail or barge, natural gas is delivered through pipelines, oil is delivered by tanker, and nuclear fuel is delivered by rail and truck. Florida receives 98 percent of its transportation fuel by sea via barge and tanker ship into seven ports. Any one of these transport systems could be halted by a disaster or severe weather.

Historically, Florida's electric utilities have pursued fuel diversity by maintaining a relative balance of energy generation from coal, natural gas, oil, and nuclear. However, due to continued growth in the state's electricity demand and relatively low natural gas prices in the mid to late 1990's, Florida's utilities turned to gas-fired generating units to satisfy economic and reliability needs. Between 1990 and 2005, the vast majority of new generation facilities constructed in Florida were natural gas-fired combined cycle turbines.

Current trends indicate Florida's dependence on natural gas to generate electricity will continue to increase; forecasts project that new generation capacity will be at least 80 percent natural gas-fired. If Florida meets these projections it will lead to an over-reliance on one fuel type -- natural gas -- affecting the reliability of electric utility generation supply in Florida. While expansions of natural gas capacity are needed and already underway, improving generation fuel diversity would enhance reliability over the long-term. Too great a reliance on a single fuel source leaves Floridians subject to the risks of price volatility and supply interruption.

In an effort to diversify the national fuel supply and keep the cost affordable, a number of utilities are looking at nuclear facilities for the first time in several decades. Due to its zero greenhouse gas (GHG) emissions in the production phase of its plant life cycle, nuclear energy has taken on increased importance in strategies for meeting future energy demand. The first full application of a new nuclear unit in the United States since 1979 was filed with the Nuclear Regulatory Commission on September 24, 2007, by NRG Energy. Two Florida utilities have expressed interest and intent to expand current nuclear capacity or construct new nuclear generating facilities. Through the Energy Policy Act of 2005, the federal government offers tax incentives, loan guarantees, and other subsidies to nuclear power. Florida also enacted statutory provisions in 2006 to allow for advanced cost recovery for nuclear power. On going concerns regarding nuclear waste disposal remain as a key issue to address.

In addition to nuclear, many states take advantage of their native resources in order to reduce the use of imported fuels. Energy sources native to Florida include solar, wood pellets and other biomass, waste-to-energy, exothermic (produced in phosphate

recovery), wind, and a small amount of hydroelectric power, in Northwest Florida. These alternative energy sources currently produce approximately two percent of the state's energy portfolio and have not been fully developed. There remain great opportunities to develop Florida's native resources. For example, FPL Group, a generator of electric power, announced in September 2007, a seven-year \$2.4 billion investment program aimed at increasing U.S. solar thermal energy output. FPL is planning to build 300 megawatts of solar-generating capacity in Florida using solar thermal technology.

In addition to diversifying fuels, Florida must modernize its energy infrastructure. To meet the planned increase in natural gas use for power generation, Florida will require additional pipeline capacity. The transmission system must be upgraded to handle improvements in "next generation technologies." New infrastructure will be required for incorporating renewable energy sources on larger scales. Alternative energy systems may require changes in transmission systems.

In the transportation sector, national energy security issues focus on U.S. refineries. Currently, domestic oil refineries are running at near-maximum capacity and represent a bottleneck in the oil supply chain. Due to environmental, safety, and aesthetic reasons, adding oil refinery capacity is difficult. Biofuels may help stabilize near-term oil prices by serving as fuel extenders, allowing fuel companies to sell more gallons than their petroleum refineries are capable of producing. Since biofuel plants do not pose many of the same concerns as oil refineries, they are viewed as a solution to the refinery capacity dilemma. As the demand for transportation fuels increase, Florida's infrastructure for producing, storing, and transporting that fuel or biofuel to market will need to expand, including new storage capacity in Florida's ports.

Addressing Global Climate Change

Since the beginning of the industrial age in the late 1700s, increases in the atmospheric abundance of greenhouse gases and changes in solar radiation and land use have contributed to an incremental alteration of the world's climate system. The accumulation of GHGs in the atmosphere is a natural part of the Earth's climate system and has been beneficial to our living environment. The Earth's natural system traps some of the energy from the sun and creates a "greenhouse" effect, providing habitable temperatures to which life has adapted.

Concentrations of GHGs in the Earth's atmosphere now exceed pre-industrial amounts, driven largely by the combustion of fossil fuels and land use changes. Between 1970 and 2004, global emissions have increased by 70 percent (24 percent between 1990 and 2004), from 28.7 to 49 gigatons of carbon dioxide equivalents. Of those, emissions of carbon

dioxide (CO₂) grew by about 80 percent between 1970 and 2004 (28 percent between 1990 and 2004) and represented 77 percent of total anthropogenic GHG emissions in 2004.³

The largest growth in global GHG emissions between 1970 and 2004, an increase of 145 percent, has come from the energy supply sector. The growth in direct emissions in this period from transport was 120 percent; industry 65 percent; and land use, land use change and forestry grew by 40 percent. Between 1970 and 1990, direct emissions from agriculture grew by 27 percent. Without specific action, global emissions of CO₂ from energy use in 2030 are projected to grow from 45 percent to 110 percent more than emissions measured in the year 2000.⁴

Fossil fuel consumption in automobiles and electric power plants worldwide results in the emission of approximately 5.5 billion metric tons of CO₂ each year and deforestation contributes an estimated additional 1.6 billion metric tons annually⁵. Other GHG increases of methane and nitrous oxide are due primarily to agricultural activities.

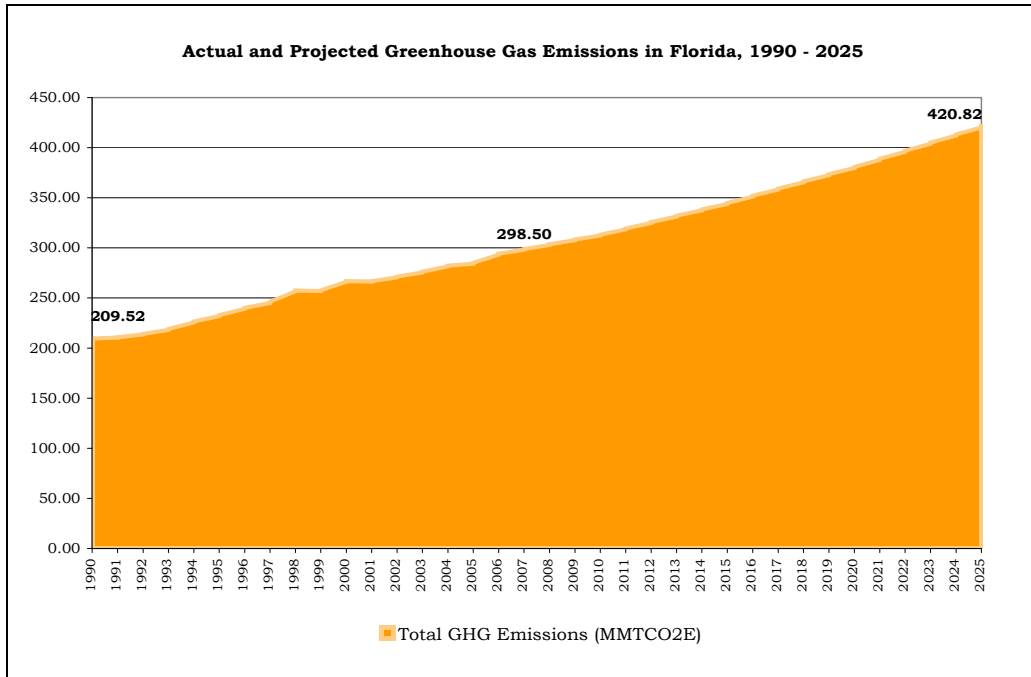
Florida's Emissions of Greenhouse Gases

Florida's CO₂ emissions increased from 191 million metric tons in 1990 to 252 million metric tons in 2003. Fossil fuel combustion is responsible for the majority of GHG emissions in Florida – these emissions increased from 188 million metric tons of CO₂ equivalent (MMTCo₂E) in 1990 to 256 MMTCo₂E in 2004, and account for about 89 percent of Florida's GHG emissions.

³ Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, Working Group III, May 2007, available at http://news.bbc.co.uk/1/shared/bsp/hi/pdfs/04_05_07_ipcc_report.pdf

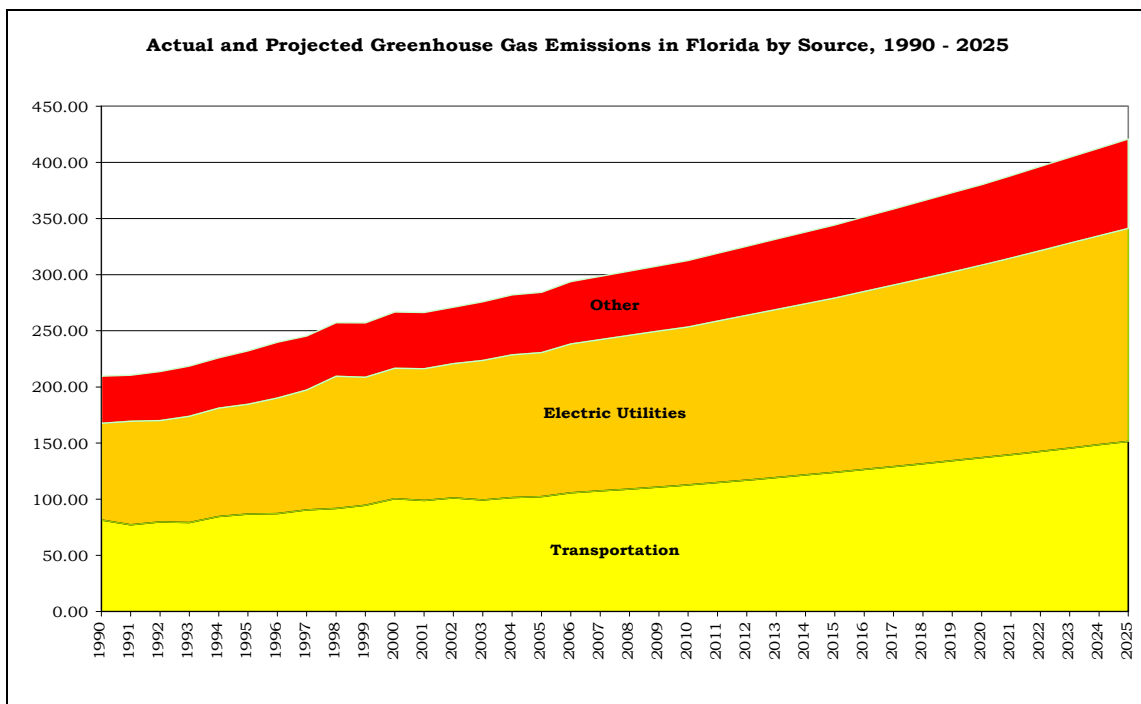
⁴ Ibid

⁵ U.S. National Aeronautics and Space Administration. "Earth Observatory: The Carbon Cycle." Available at: http://earthobservatory.nasa.gov/Library/Carboncycle/carbon_cycle.html



Source: Florida Department of Environmental Protection

GHG emissions from fossil fuel combustion are primarily attributable to the utility and transportation sub-sectors, which comprise 49 percent and 43 percent of emissions from the energy sector, respectively. This means that our GHG emissions are largely attributable to supplying our demand for electricity and transportation. The growth in Florida's emissions will come primarily from electric utilities and from the transportation sector, as noted below.



Source: Florida Department of Environmental Protection

The Effects of Global Climate Change on Florida

The consequences of global climate change are becoming better understood. By virtue of Florida's geography, changes in sea level are of particular concern. The climate change computer models reviewed in the most recent assessment report by the United Nations Intergovernmental Panel on Climate Change (IPCC) indicate an expected sea level rise by the end of the present century without a concerted effort to reduce emissions⁶.

Climate change could negatively impact Florida's economy. Florida could experience a rise in sea level, climbing temperatures, alterations in rainfall, damage to coral reefs, increased beach erosion, and negative impacts to fish and wildlife. In the short term, global climate change may enhance Florida's agricultural production due to warmer temperatures and a longer growing season. But in the long term, global climate change could lead to lower yields of such critical economic crops as citrus, sugarcane and tomatoes due to rising temperatures, changes in precipitation, and shortages of fresh water. Adaptation to a changing climate in Florida may give rise to new economic opportunities.

If Florida and other states and nations act now to reduce emissions of greenhouse gases, many of these effects may be avoided or minimized. The actions necessary to reduce greenhouse emissions are available to every household, every community, and every state in the nation. There is a cost associated with some of these actions, but there is also a cost of failing to act now.

The growing public awareness of climate change within the United States is reflected in the increased level of activity within the Congress on this issue. As of this writing, lawmakers had introduced more than 125 bills, resolutions, and amendments specifically addressing global climate change.⁷ Further, the international community will gather in Bali, Indonesia, in November 2007, to begin negotiations for a successor treaty to the Kyoto Protocol. Global scale regulatory programs governing GHGs are increasingly likely and must be incorporated into energy policy decisions. As Florida may bear a disproportionate share of the cumulative impacts of global climate change, it is in Florida's best interest to ensure that national and international programs lead to early emission reductions.

⁶ Summary for Policymakers, IPCC WGI Fourth Assessment Report, Oct. 2007, available at <http://www.ipcc.ch/SPM2feb07.pdf>

⁷ Pew Center on Global Climate Change, *What's Being Done in Congress?*, available at: http://www.pewclimate.org/what_s_being_done/in_the_congress/

MEETING FLORIDA'S CHALLENGES: FINDINGS AND RECOMMENDATIONS

Executive Order 07-128 established the Governor's Action Team on Energy and Climate Change and an 11-point charge to be addressed by November 1, 2007. In organizing the development of policy findings and recommendations, the Action Team found it convenient to organize the 11 points into five categories:

1. Florida's Power Generation Sector,
2. Florida's Transportation Sector,
3. Florida's Government Sector,
4. Organizing State Government for Florida's Energy Future, and
5. The Blueprint for Florida's Final Climate Action Plan.

Across the full range of energy issues and opportunities facing Florida in 2007, greater public engagement is required. Many actions to increase Florida's energy security and reduce emissions of greenhouse gases are available to consumers today through energy conservation and the wider use of energy efficiency technologies. Public education and outreach across the full range of issues addressed within this document will be critical to the ultimate success of Florida's efforts to embrace our future.

Florida's Power Generation Sector

The Action Team identified Executive Order 07-128 charge items 3, 4, 5, 6, 10 and 11 as relating most directly to the power generation sector. This section provides an overview of the power generation sector in Florida and then outlines the specific issues, findings, and recommendations for the six charge items related to the power generation sector.

Florida's electric generators are capable of producing 56,038 megawatts (MW) of electricity to meet the needs of customers and we are capable of importing another 3,600 MW of electricity into Florida. The growth in total electrical energy consumption has averaged 3 percent per year more than the average consumption of the past decade as consumers use increasingly more electric appliances (i.e., computers). The average rate of electricity consumption exceeds Florida's average population growth rate. Florida's population is expected to grow at 1.93 percent per year during the next decade, indicating a continued strong growth in electrical energy consumption within the state.

According to the Florida Reliability Coordinating Council using a business as usual scenario, the state's total electric energy consumption is projected to grow at an average 2.74 percent per year during the next 10 years. In order to meet electric consumption needs, Florida's utilities must continually build, upgrade, and expand their inventories of generating units. During the next 10 years, Florida's electric utilities will need to add approximately 16,362 MW of new capacity in order to meet Florida's growing demand.

Residential customers are the largest users of electricity in the State of Florida. As shown in the chart below, residential customers use more than 52 percent of the electricity generated in Florida, demonstrating the opportunities at the consumer level for conservation and energy savings. Conservation can be done immediately and can forestall the need for new power plants.

| Florida Electric Customer Usage 2005, Florida Public Service Commission | | | | |
|--|----------------------------|--------------------------------|--------------------------------------|-----------------------------------|
| Customer Class | Number of Customers | Percentage of Customers | Energy Sales (gigawatt-hours) | Percentage of Energy Sales |
| Residential | 7,962,111 | 88.7 | 114,156 | 52.8 |
| Commercial | 981,885 | 10.9 | 78,809 | 36.4 |
| Industrial | 36,188 | 0.4 | 23,431 | 10.8 |
| Total | 8,980,184 | 100.0 | 216,396 | 100.0 |

While demand for energy is growing, there is time to address Florida’s future energy needs in a deliberative fashion. Floridians enjoy a relatively low-cost, stable, and reliable supply of electricity. Of Florida’s current 56,000 MW of capacity, approximately 14,000 MW has been constructed since 1999, representing a 33 percent increase.

Action Team Charge: Policies for emission reporting and registry that measure and document emission reductions

Since the establishment of environmental protection laws more than 40 years ago, regulated sources of air pollutants have been gathering and reporting detailed information about compounds emitted to the atmosphere. However, reporting to a registry would differ from traditional reporting in that a registry requires the application of a consistent quantification method (a protocol), third-party verification, and the reporting of the resulting information to a central repository.

Effective policy design requires the best possible information. In working through its charge, the Action Team repeatedly heard policy experts and decision-makers from other nations and states underscoring the importance of detailed GHG emissions data. Presenters indicated that they had originally assumed that existing data about emissions would be sufficient for program design; however, they soon found this information to be less comprehensive than first supposed. The development of consistent and repeatable emissions data is important to Florida before implementing an emissions reduction program at the state level. Further, it is critical to Florida, and to emitters of GHGs in Florida, to ensure that baseline emission levels are registered and verified using a recognized protocol in advance of any federal or international program. Without such

registries, early emission reduction efforts run the risk of not being recognized under any program developed in the future.

The Climate Registry is an existing, ongoing collaboration between states, provinces, and tribes aimed at developing and managing a common GHG emissions reporting system. In May 2007, Governor Crist authorized Florida to join 33 other states as an inaugural member of the not-for-profit corporation. The Climate Registry now includes 39 of the 50 U.S. states, one Mexican state and two Canadian provinces (with the balance of Canadian provinces committing to join). The registry will be capable of supporting various GHG emission reporting and reduction policies for its member states and tribes and reporting entities. The registry will provide an accurate, complete, consistent, transparent, and verified set of GHG emissions data from reporting entities, supported by a robust accounting and verification infrastructure. The Climate Registry has released the draft protocol for stakeholder comment and is on track to open for business in early 2008.

As a general principle for Florida's emerging climate change policies, every effort should be made in the program design to make use of tools that can be incorporated into future national or international emission reduction programs. The Climate Registry is one such tool.

Action Team Findings and Recommendations for Charge:

- a. Finding: The Action Team finds that quality emissions data from across Florida's economy is critical for the effective design and implementation of any future market-based mechanism.
- b. Finding: The Action Team finds that Florida's participation in The Climate Registry [which now numbers 39 of the nation's 50 states, one Mexican state, and two Canadian provinces with the balance of provinces committed to joining] efficiently incorporates common reporting protocols for companies doing business in multiple states, including Florida, and establishes an equivalent reporting environment for Florida-based businesses that wish to participate.
- c. Finding: The Action Team finds that in advance of a federal greenhouse gas program, it is in Florida's best interest to document emissions of greenhouse gases from as many sources within the state as possible using nationally recognized reporting protocols.
- d. Recommendation: The Action Team recommends mandatory greenhouse gas emission reporting by all electric utilities to The Climate Registry using The Climate Registry's reporting protocols.
- e. Recommendation: The Action Team recommends that the Department of Environmental Protection consider and propose additional industry sectors as appropriate for inclusion in mandatory registry reporting.

Action Team Charge: Market-based regulatory mechanisms, such as cap and trade programs, for use in efficiently reducing greenhouse gas emissions

DEP has initiated rulemaking to adopt a maximum allowable emissions level of GHGs for electric utilities in the state. The Action Team is examining market-based regulatory mechanisms to make appropriate recommendations and examine the broader question of how the GHG emissions standard will ultimately work. In considering this question, the Action Team reviewed staff analyses, heard several expert presentations, and discussed the merits of the two principal market-based regulatory mechanisms: tradable allowances and carbon fees. It should be noted that the use of one mechanism does not preclude the use the other.

A carbon fee is the cost placed on each unit of CO₂ emissions and is remitted to a taxing authority. A carbon fee policy fixes the marginal cost for carbon emissions and allows quantities emitted to adjust, so the exact level of CO₂ reduction is unknown until the fee is actually implemented.

An emissions trading system features a fixed quantity of emissions (the cap) and the quantity of emission allowances that can be bought and sold (the trade). Cap and trade systems fix the total amount of carbon emitted and allow price levels to fluctuate according to market forces. This ensures achieving a specific carbon reduction target, but could possibly result in higher transactions costs. While both policy approaches are considered "market-based," the implementation details and expected outcomes of each policy are distinct.

The benefits of a direct carbon fee over a cap and trade system include a broader scope for emissions reduction (carbon fees can extend to all carbon-based fuel consumption), lower transaction costs, a permanent incentive to reduce emissions, and lower administration costs. However, the efficiency gained from directly pricing GHG emissions is offset by the potentially regressive nature of fees. This regressive nature arises from the fact that, as a percentage of income, a carbon fee could affect lower-income individuals more profoundly than higher-income individuals. One solution to this problem of regressive carbon fees is to redistribute some portion of the revenue earned by this fee back to lower-income individuals. This redistribution effort is often referred to as a revenue-neutral tax. Designing a carbon fee to be revenue-neutral with respect to Florida's tax system would be challenging; comprehensive changes in tax policy historically have been difficult to achieve.

The benefits of a cap and trade approach include greater upfront assurance as to the amount of emissions to be reduced, simply because a cap is set by the program. This approach also may be less of an administrative/government burden, since emission reduction levels are easier to determine than relative tax rates. Unlike a carbon fee, a cap and trade program could create economic development opportunities in offset sectors,

such as forestry and agriculture, given those sectors' carbon storage characteristics. A cap and trade program would also enable Florida to link its program to others under way in other nations and regions of the United States. The Regional Greenhouse Gas Initiative (RGGI) in the northeastern United States, the Western Climate Action Initiative (WCAI) covering six western states, and the leading bills in Congress tend toward cap and trade approaches to reducing emissions. As markets evolve over time, this linkage may result in a fairly uniform cost for allowances, thus enabling Florida's emitters to approach a level economic playing field with those in other states and regions actively working to reduce emissions.

Action Team staff prepared a cap and trade "design menu" as a means of outlining critical choices in the process of designing a program. Such choices include which greenhouse gases to include, which economic sectors to include in the cap, how to address cross-state issues, whether or not a Florida-based allowances market should be linked with other regional or international markets, and the use of emission reduction credits as a means of complying with caps. Other critical issues include the allocation of allowances (auctions, free allocations, or combination thereof); rules for borrowing and banking of credits from one year to the next; and options for using cost constraint mechanisms in the event of natural or economic emergencies.

Action Team Findings and Recommendations for Charge:

- a) Finding: The Action Team finds that the use of market-based mechanisms is likely to reduce GHG emissions in Florida with greater flexibility and with less net cost than would be the case with traditional regulatory emissions caps alone.
- b) Finding: The Action Team finds that the two principal options (cap and trade, carbon fees, or combinations thereof) each have specific positive and negative considerations, and that each tool has specific applications for which it is best suited.
- c) Finding: The Action Team finds that, given the diversity of sources for GHG emissions, the use of one or more market-based mechanisms to address specific sectors may be warranted over time.
- d) Recommendation: The Action Team recommends that Florida pursue a market-based policy of "cap and trade" by creating tradable emissions allowances as the preferable means meeting the utility sector emissions cap and the statewide emission reduction targets directed by Governor Crist in Executive Order 07-127.
- e) Recommendation: The Action Team recommends a market design process for Florida's tradable allowances market as a vital component of the Florida's Energy and Climate Change Action Plan development process to occur in 2008. This design process should result in final recommendations for several considerations, including but not limited to:
 - an allowance allocation process,
 - economic and emergency safety valves,
 - the creation and use of emission offset credits,

- a “leakage” strategy regarding the migration of emissions into surrounding states,
- trial periods, and
- timeframes for full implementation.

The design process should consider linking a Florida-based allowances trading market with other regional or international markets.

Action Team Charge: Other policies for efficiently reducing emissions in Florida in conjunction with, or independent of, regional, national or international agreements

In working through the issues associated with market-based mechanisms to reduce GHG emissions, the Action Team received presentations and staff analyses. A critical consideration emerging from this process was whether to link Florida's emerging GHG policies with the activities of other states, regions, or nations.

Presentations of first-hand experience with cap and trade systems from representatives of the European Union's Emissions Trading System and the Regional Greenhouse Gas Initiative (RGGI) were heard and discussed, as were Florida's opportunities to participate in other markets. Various levels of market linkage appear to be available to Florida, although a recommendation for a specific course of action cannot be provided by the Action Team at this time.

The benefits of market linkage may include a lower cost for emissions allowances due to the increase in scope that linked markets would present. Market linkage could result in emissions offset credit project development or allowance purchases from sources in Florida, resulting in a flow of funds from out-of-state. Regardless of the direction of money flows into or out of Florida, linking with other markets would expand options for emissions reductions and should reduce the costs of achieving those reductions.

The Action Team recognizes the importance of national and international actions to address global climate change. Substantive national legislation addressing greenhouse gas emissions has been proposed and discussed by Congress. While no legislation has yet passed, the dialogue continues and it is anticipated that some action will be taken within the next few years. Florida has been monitoring and will continue to support efforts in Washington to enact bipartisan climate change legislation that will assist and support Florida's interests.

The issues around market linkage will require further analysis and consideration, particularly as the Action Team develops design recommendations for a cap and trade program through the facilitated process in 2008.

Action Team Findings and Recommendations for Charge:

- a. Finding: The Action Team finds that the emerging global carbon market may present Florida with cost effective opportunities to reduce emissions of greenhouse gases.
- b. Finding: Further, the Action Team finds that linkages with other markets create economic development opportunities and external sources of capital to fund greenhouse gas offset projects located in Florida.
- c. Recommendation: In order to enable the sale of carbon credits from emission offset projects developed in Florida, the Action Team recommends that Florida pursue emission offset monitoring and verification programs and agreements including but not limited to a Memorandum of Understanding with the Regional Greenhouse Gas Initiative (RGGI).
- d. Recommendation: The Action Team recommends further exploration of linkages to other emerging markets domestically and abroad as a feature of the market design process recommended for the second phase of the Action Team's work in 2008.

Action Team Charge: Policies to reward early emission reductions in advance of statewide or national greenhouse gas regulatory programs

In 2007, Florida has assumed a leadership position among states in addressing the concerns of increasing energy security and combating global climate change. Given the potential perils of inaction and the compelling benefits of early adoption, a move toward early emission reductions is clearly in Florida's best interest. In assuming this leadership role, Florida should ensure that any emission reductions achieved in Florida as a result of this emergent policy are recognized as credited in any future national or international program to combat global climate change.

The strategies for protecting Florida's interests include close partnership with our congressional delegation to ensure that federal legislation includes favorable terms for existing state programs. Use of verified emission registries by emitters of GHGs is important to document such emission reductions. The design of Florida's market-based programs, and later design of such programs at the federal level, can incorporate incentives for early emission reductions.

Action Team Findings and Recommendations for Charge:

- a. Finding: The Action Team finds that verified emission reductions by sources in Florida in advance of any state, national, or international program are in the State of Florida's best interest.
- b. Finding: Further, the Action Team finds that verified emissions baselines are in the best interest of those companies with a reasonable expectation of future greenhouse gas regulation.

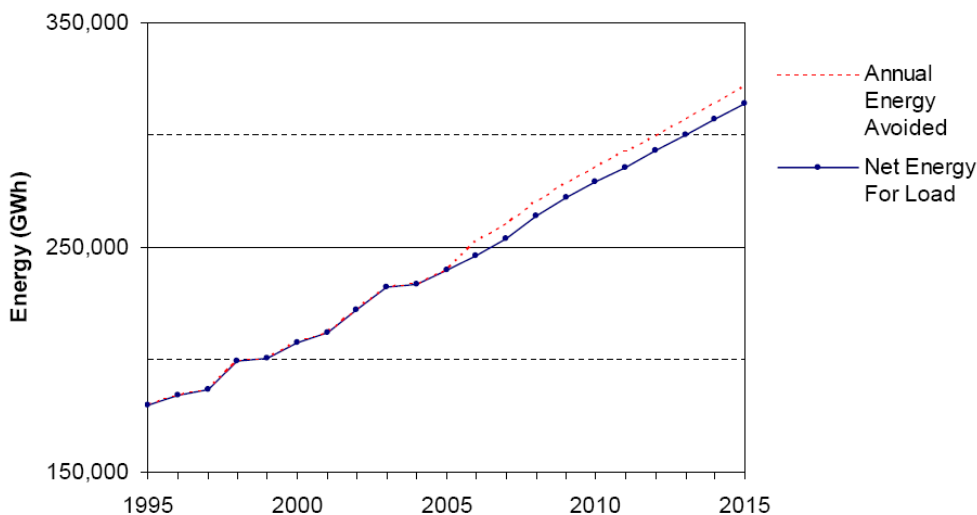
- c. Recommendation: The Action Team recommends that an early reductions incentive policy be incorporated in the market design process recommended for the second phase of the Action Team's work in 2008.

Action Team Charge: Policies to enhance energy efficiency and conservation, including statewide targets

Residential customers use more than half the electricity being generated in the state; consequently, the importance of energy conservation and energy efficiency within each home is critical. If Florida is serious about reducing its dependence on foreign fuels then personal conservation must be strongly emphasized.

Florida has a long history of encouraging utility conservation in the state. Since the enactment of the Florida Energy Efficiency and Conservation Act (FEECA) in 1980, utility-sponsored demand-side management (DSM) programs have resulted in significant reductions in customer demand and energy requirements. The policies that have guided these efforts have been focused on keeping customer electric rates as low as possible and not on reducing greenhouse gas emissions. A reduction in energy usage typically results in a corresponding reduction in air emissions. As shown in the graph below provided by the Florida Public Service Commission, utility DSM efforts have resulted in reductions in annual energy requirements of approximately 5,500 gigawatt-hours (GWH) in 2005 and are projected to increase to approximately 7,000 GWH by 2014. For the years 1994 through 2005 actual annual energy supplied is shown which includes the effects of utility DSM programs. In other words, for these years, the annual energy supplied would have been higher if not for utility DSM programs. Assuming an average annual energy usage of 14,000 kilowatt-hours per residential customer, the reduction of 5,500 GWH is enough energy to serve approximately 392,000 customers.

Impact of Demand-Side Management on Energy Consumption in Florida



Source: Florida Public Service Commission

Under FEECA, utilities have instituted several programs that conserve energy or increase the efficiency with which it is used. These programs include such diverse actions as installing additional insulation in residences, installing programmable thermostats and other advanced controls, and instituting time-of-use pricing in which rates change throughout the day in accordance with demand. Avoided generation has the best possible GHG performance of any supply-side energy measure.

Current Florida Public Service Commission (PSC) rules require each proposed conservation or efficiency program offered by utilities meet the Rate Impact Measure (RIM) test. In the RIM test, the cost of implementing a proposed action cannot cause an increase in the rates charged for electricity to the general body of ratepayers who may not benefit directly from the program. The RIM test has been criticized because it does not calculate or impute the positive effects of the conservation or efficiency measure on the general body of ratepayers. Instead, the RIM test only considers the per kilowatt hour rate that is charged.

There are other tests used to measure the cost-effectiveness of conservation and efficiency programs, including the Participant Test and the Total Resource Cost (TRC) Test. The Participant Test, as its name implies, focuses on the participant in the program and measures the impact of the program on the specific customer. In the Participant Test, the cost of the equipment is weighed against the benefits to the customer of the avoided appliance cost (e.g., an energy efficient refrigerator) and subsequent electric bill reduction. In the TRC test, the costs and benefits are viewed from the perspective of society at large. The total program and participant costs are compared to the total

benefits that accrue to both the participant as well as the avoided costs to the utility. The avoided costs to the utility from the conservation or efficiency perspective would include fuel costs, new generation costs, operations and maintenance costs, and capital outlay costs.

In order to realize many opportunities for increasing energy efficiency in Florida, specific investments of capital will be necessary. Such investments range from specific appliance upgrades within a single family home, to “relamping” a commercial building, to upgrading electric utility equipment.

In addition to utility-based programs, Florida currently provides rebates for solar hot water heaters and other utilization of small-scale renewables that work as demand-side management actions. In 2006, the Florida Legislature created the Solar Energy Systems Rebate Program, which provides rebates of five dollars per watt for photovoltaic solar installations up to \$20,000 per residence and \$15.00 per 1,000 BTU for solar hot water systems and up to \$5,000 per residence.

Finally, it should be recognized that under Florida's current utility rate structure for investor-owned utilities, additional energy efficiency and conservation measures may have a negative financial impact for utilities. Historically, utility rate structures encourage the sale of power. In order to align conservation incentives with the utilities' business model, Florida should examine alternative rate structures that might provide a more realistic economic basis for utilities to implement viable climate change policies without harming their return on investment.

Within such a model rate structure, Florida's effort to stimulate renewable and low carbon fuels, conservation, and efficiencies can have a significant impact on reducing Florida's demand for energy and lowering carbon emissions. Education and outreach efforts are underway for existing energy efficiency programs but may need to be expanded and enhanced. New incentive programs to meet the special needs of low-income consumers require further examination. Market failures such as misaligned incentives, end-user behavior, and program costs are often cited as reasons why energy efficiency is not more widely adopted among these consumers.

Action Team Findings and Recommendation for Charge:

- a) Finding: The Action Team finds that energy conservation and energy efficiency are critical in enabling Florida to reach specific GHG emission reduction targets.
- b) Finding: The Action Team finds that several energy efficiency technologies available in the marketplace today are cost-effective beyond the degree to which they are utilized by Floridians, and thus represent emission reduction opportunities available at a net benefit to consumers.
- c) Finding: The Action Team finds that additional effort in making the public aware of existing energy efficiency and conservation programs offered by

- utilities is required to increase participation rates and the benefits of such programs for Florida.
- d) Finding: The Action Team finds that the current regulatory structure for the electric utility sector within Florida may pose disincentives for investments yielding greater energy efficiency and thus reducing utility sales.
 - e) Recommendation: The Action Team recommends further examination of the issue of statewide energy conservation and efficiency targets as a component of the facilitated process recommended for the second phase of the Action Team's work in 2008.
 - f) Recommendation: The Action Team recommends legislative authority for the Public Service Commission to develop programs which provide utilities with financial incentives to make investments in residential and commercial solar hot water systems and other renewable and energy efficiency technologies.
 - g) Recommendation: To build upon the 15 percent increase in energy performance of new construction by 2009 as directed by Governor Crist in Executive Order 07-127, the Action Team recommends stepwise improvements in building efficiency targets beyond 2009.
 - h) Recommendation: To build upon the 15 percent increase in appliance efficiency standards directed by Governor Crist in Executive Order 07-127, the Action Team recommends expanded legislative authority to incorporate additional residential appliances and commercial appliances not subject to federal preemption.

Action Team Charge: Strategies to diversify Florida's electric generation fuels to reduce greenhouse gas emissions and protect Florida's consumers from fuel price volatility

Florida's electric utilities have pursued fuel diversity by maintaining a balanced fuel supply in the types of fuel used to generate electricity. The state's utilities had a relative balance of energy generation between coal, nuclear, natural gas, and oil. However, due to continued growth in the state's electricity demand and relatively low natural gas prices, utilities turned to gas-fired generating units to satisfy economic and reliability needs. Between 1990 and 2005, the vast majority of new generating capacity constructed in Florida was natural gas-fired combined cycle turbines, leading to an increase in the percentage of the state's energy generated by natural gas. As the ten-year site plan indicates, electric utilities plan to meet much of their expected new demand by adding more natural gas capacity.

| FUEL DIVERSITY IN FLORIDA CURRENT AND PROJECTED | | | |
|--|-------------|-------------|-----------------------|
| Fuel | 2006 | 2016 | Percent Change |
| Natural Gas | 39 % | 54 % | + 15 |
| Coal | 29 % | 23 % | - 6 |
| Nuclear | 13 % | 12 % | - 1 |
| Oil | 7 % | 4 % | - 3 |
| Interchange | 5 % | 2 % | - 3 |
| Other | 5 % | 4 % | - 1 |
| Non-Utility | 2 % | 1 % | - 1 |

Florida's current renewable energy portfolio is relatively small at approximately 2 percent of the state's total installed capacity. The principal sources of renewable energy in Florida are combustion of municipal solid waste at 378.2 megawatts (33.9 percent), biomass at 377.3 megawatts (33.8 percent), waste heat at 292.5 megawatts (26.2 percent), hydroelectric at 54.5 megawatts (4.9 percent), and landfill gas at 12.2 megawatts (1.1 percent). Sources of biomass include material collected from wood processing, foresting, urban wood waste, and agricultural waste. Waste heat is collected when processing phosphate into fertilizer and other products.

The share of renewable fuels in Florida's fuel mix is growing. In July 2007, Progress Energy Florida announced a contract to purchase electricity from a 300 MW biomass facility. The project would inject \$150 million into the local economy and create 75 new jobs.

Another potential source of renewable, clean energy is from Florida's ocean. The Gulf Stream Current flows northward past the southern and eastern shores of Florida at a rate that is more than five times as energy-dense as the world's best wind power-generating sites. The ocean current energy resource of Florida has a potential generating capacity in excess of 10 gigawatts, equal to some 10 nuclear power plants. Capturing the energy created by this flow creates the potential for base-load, summer-peaking energy generation with an annual average power density of 1.95 kW/m² and an average summer power density of 2.52 kW/m². Harnessing ocean energy will also create a new economic sector and associated industries with the potential for tens of thousands of jobs and billions of dollars of revenue. The construction and installation of the local harvesting systems may generate in the order of 10,000 technical jobs alone, engineering and technical efforts will yield a new high-tech Florida-based sector with potential for several thousand more high-skilled positions. System management, maintenance, and repair of the equipment and support systems may create as many as 10,000 more jobs.

Opportunities for investment in alternative fuel technologies and for creative business solutions to the emission and disposal questions are clearly evident in the state. State and federal funding and incentives are available for research and innovations; viable

opportunities for private investment in a variety of potential technology breakthroughs are rapidly becoming more common. Industry efforts have begun to examine or address the use of native fuels such as biomass, solar, wind power, and ocean energy. However, these alternative generation methods are not expected to displace fossil fuels as a primary supplier of the state's energy in the near-term.

Fuel oil and natural gas peaking generators produce the greatest amount of carbon emissions per kWh. The fuel sources with the lowest carbon emissions include nuclear and non-combustible renewable energy sources such as solar and wind. The following table provides a comparison of the various fuels used in electric generation and the amount of carbon emissions per megawatt hour.

| CARBON DIOXIDE EMISSION RATES OF SELECTED ELECTRIC GENERATION FUELS | | | |
|--|--|---|---|
| Fuel | Assumed Heat Rate⁸ | Lbs CO₂/mmBtu⁹ | CO₂ emissions/MWh |
| | (mmBtu/MWh) | | (Short Tons) |
| Nuclear | 0 | 0 | 0 |
| Non-Combustible Renewables | 0 | 0 | 0 |
| Hydro | 0 | 0 | 0 |
| Natural Gas Combined Cycle (Existing) | 7.196 | 117.08 | 0.42125384 |
| Natural Gas Combined Cycle (New) | 6.752 | 117.08 | 0.39526208 |
| Natural Gas Peaker (New) | 9.227 | 117.08 | 0.54014858 |
| Natural Gas Peaker (Old) | 15 | 117.08 | 0.8781 |
| Existing Residual Fuel Oil (Steam) | 11 | 173.9 | 0.95645 |
| Existing Pulverized Coal (Bituminous) | 10 | 205.3 | 1.0265 |
| Existing Pulverized Coal (Sub-bituminous) | 10 | 212.7 | 1.0635 |
| New Pulverized Coal (Bituminous) | 8.844 | 205.3 | 0.9078366 |
| New Pulverized Coal (Sub-bituminous) | 8.844 | 212.7 | 0.9405594 |

Several possible solutions to carbon emissions from burning fossil fuels are being considered. One in particular is carbon capture and storage (CCS) or sequestration. This involves capturing CO₂ from the power generation flue gas, compressing the emission, transporting it to an approved storage site, and finally injecting the compressed CO₂ into deep underground geological formations. At the present time, sequestration of carbon emissions is an entirely experimental and uncertain technology. In addition to the problem of separating CO₂ from the flue gas, there are also concerns about the adequacy of Florida's geology for storing and containing large amounts of

⁸ Heat Rates (except existing coal and fuel oil and old gas peaker) from EIA, Assumptions to Annual Energy Outlook 2006, Table 38, Page 73.

⁹ Source of Lbs CO₂/mmBtu is Electric Power Annual 2005, Table A3, Page 86.

carbon or other gases. There are public health concerns with the potential for leakage or release of the CO₂ considering the volume and concentration of these gases.

In addition to the emissions that result from fuel combustion in the electric generation process, there are other emissions that may occur during the mining or transportation of the fuel, construction of the generator, or disposal of wastes. The best means of quantifying these carbon emissions is a life cycle assessment (LCA) which also captures other environmental concerns such as water consumption. The use of LCA in making recommendations about technologies provides policymakers with a more robust understanding of outcomes in GHG emissions with each option. An LCA should be used as a tool to evaluate fuels and technologies along with cost, performance, technology, and social considerations.

Nuclear energy was recognized by the Action Team membership as being a more favorable alternative to fossil fuels because it provides no carbon dioxide emissions while producing energy. While nuclear energy holds promise for assisting Florida in reducing greenhouse gas emissions in the future, there remain significant concerns about the long term storage of spent fuel rods and fuel transportation concerns. Florida will need to continue encouraging our federal officials to address these critical issues.

Action Team Findings and Recommendation for Charge:

- a. Finding: The Action Team finds that fuel diversity within Florida's portfolio of electric generation fuels must be maintained and further enhanced.
- b. Finding: The Action Team finds that in evaluating the fuels and technologies that should be included in Florida's future portfolio of generation facilities, a life cycle assessment should be considered.
- c. Finding: The Action Team finds that energy technologies with low carbon emissions such as nuclear and renewable energy are beneficial for energy security objectives as well as greenhouse gas emission reduction objectives.
- d. Finding: The Action Team recognizes the experimental nature of carbon capture, sequestration and storage (CCS) but believes there is value in continuing to explore this possible solution to reducing or eliminating the carbon released from fossil fuel facilities in the event of a technological breakthrough.
- e. Recommendation: The Action Team recommends further examination of all energy technologies with low carbon emissions in addressing the state's goals of reducing greenhouse gases and pursuing energy security to include public outreach and engagement.
- f. Recommendation: The Action Team recommends further examination of the role of nuclear energy in addressing the state's goals of reducing greenhouse gases and pursuing energy security to include public outreach and engagement. This examination should address issues associated with the transport and storage of nuclear waste.

- g. Recommendation: The Action Team recommends that Florida adopt policies and continue funding which accelerates research, new job creation, development, and expansion of renewable resource electric production technologies which may include, but not limited to, solar, ocean energy, biofuels, and wind.
- h. Recommendation: The Action Team recommends the creation of a consortium effort among electric utilities, state government, and state universities to investigate and actively seek pilot projects on the feasibility of carbon capture, sequestration and storage within Florida.

Florida's Transportation Sector

Transportation is Florida's second largest energy use sector, comprising more than a third of the total energy used. Florida depends almost exclusively on other states and nations for supplies of oil and gasoline, producing less than one percent of the nation's crude oil annually. Each year the state consumes 10.3 billion gallons of gasoline and diesel fuel, and consumption is growing by 300 million gallons per year.

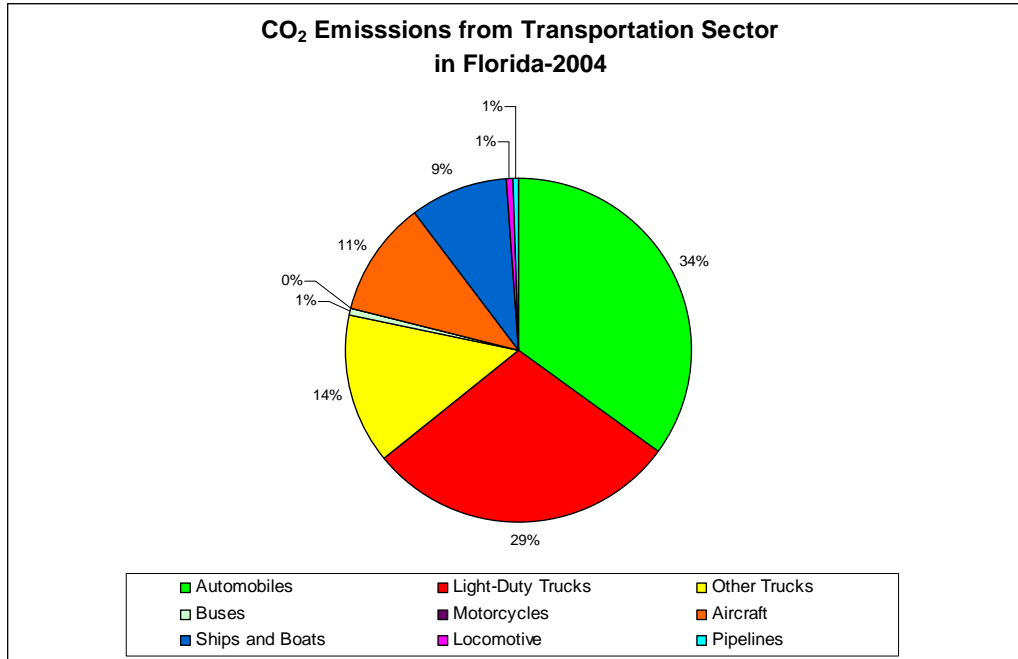
Florida has an extensive transportation system made up of roads and other means of travel. About 6,500 bridges and 12,000 miles of highway are owned by the state. The remaining parts of the transportation system are owned and operated by local government entities or the private sector including nearly 108,000 miles of local roads; about 5,000 local bridges; 29 fixed-route transit systems; 2,100 miles of rail; 14 deepwater seaports; and more than 800 active aviation facilities.

Transportation planning and decision-making in Florida occur at state, regional, and local levels. The Florida Department of Transportation (DOT) is responsible for operating and maintaining state highways and bridges and provides funding assistance to owners and operators of transit, aviation, rail, and seaport facilities and services. The DOT annually develops and implements a five-year work program based on the project priorities of metropolitan planning organizations (MPOs) and county commissions for non-MPO areas.

There are 26 MPOs responsible for regional transportation planning in urbanized areas with more than 50,000 residents. MPOs develop transportation plans based on land use and projected demographic trends, and annually submit lists of project priorities to DOT.

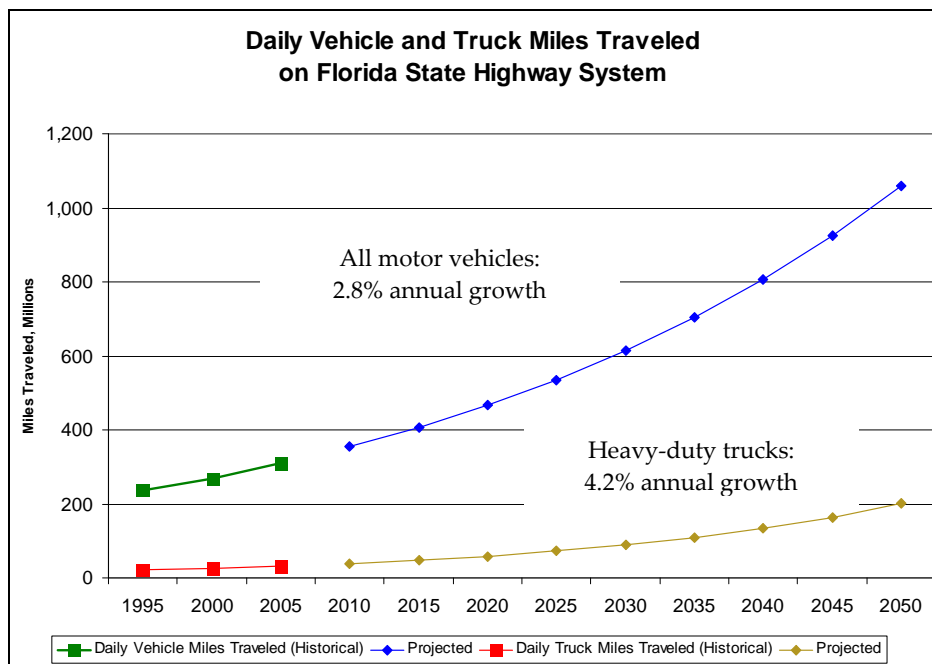
Action Team Charge: Strategies for reducing the greenhouse gas emissions from motor vehicles

Transportation is a significant contributor to GHG emissions in Florida, accounting for about 46 percent of CO₂ emissions statewide. The transportation sector's GHG emissions in Florida are dominated by personal vehicle travel in cars and light trucks, which account for almost two-thirds of these emissions (see chart below). Other trucks account for an additional 14 percent of CO₂ emissions.



Source: Florida Department of Environmental Protection

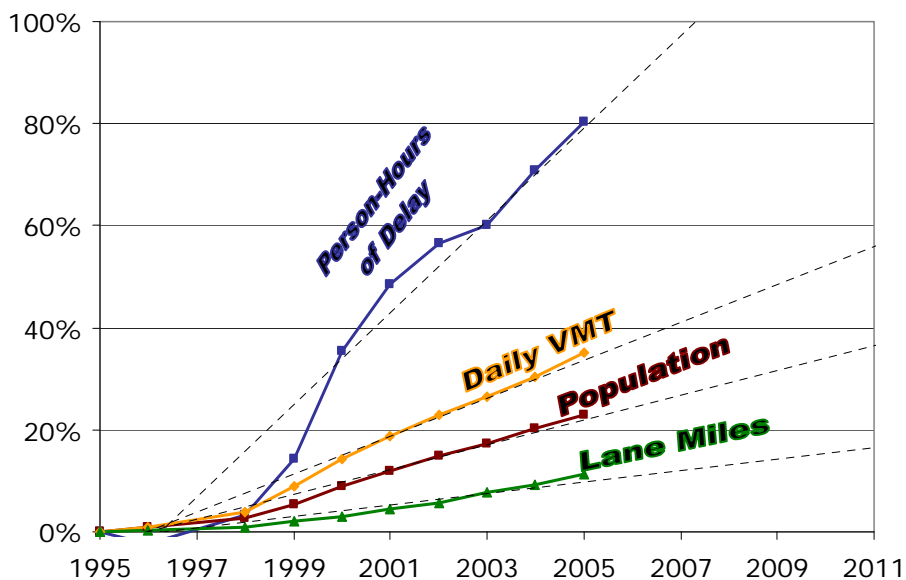
Transportation-related GHG emissions are increasing, primarily due to strong growth in travel by motor vehicles in Florida. The DOT projects that daily truck-miles traveled on state roads will increase by 527 percent to 201 million in 2050. Daily vehicle-miles traveled (VMT) on state roads are projected to exceed 1.1 billion by 2050, an increase of 240 percent.



Source: Florida Department of Transportation

Investment in Florida's transportation system has not kept pace with this growth in travel, leading to rapid increases in congestion and delay. Between 1995 and 2005, the number of lane-miles on the Florida Interstate Highway System (FIHS) – a rough measure of the total system capacity – increased 1.1 percent annually; the state's population increased 2.3 percent annually; daily VMT increased 3.5 percent annually; and person-hours of delays increased 6.1 percent annually (see chart below). Increased congestion and delay contribute further to transportation-related emissions. Vehicles operate more efficiently - and produce the least emissions - in free-flowing traffic than while idling in stop-and-go conditions.

Delay Trends on the Florida Intrastate Highway System



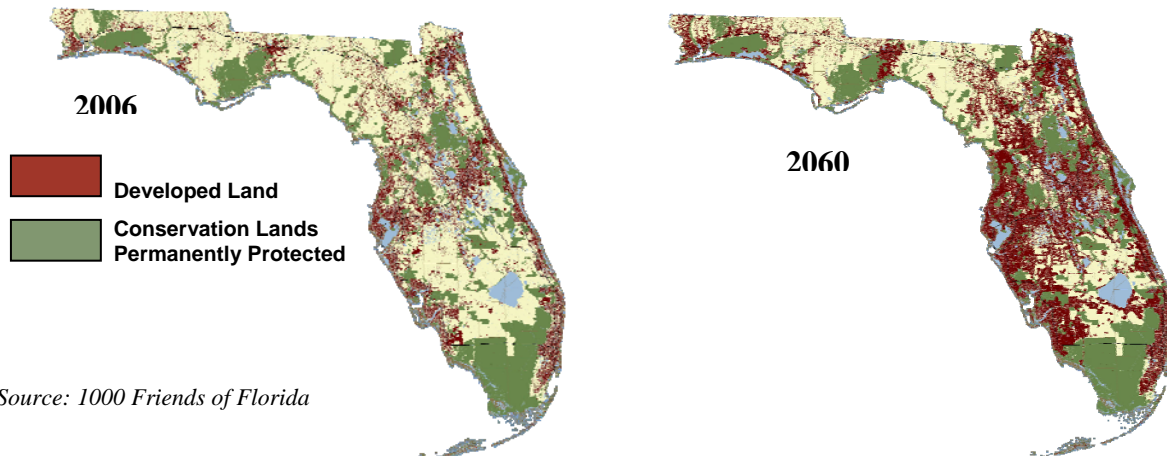
Source: Florida Department of Transportation - All data represent a three-year moving average.

Personal and freight travel on Florida's highway system is increasing for three major reasons: (1) rapid population growth has resulted in more people traveling and more people and businesses that need to send and receive freight; (2) residents are making more trips per person; and (3) trip lengths have become longer as urban areas have become larger and more sprawling.

A presentation to the Action Team by the Department of Community Affairs, indicated that urban sprawl characterizes much of Florida's post-World War II development, creating regions and communities that are automobile-dependent and not conducive to mass transit. Because many rural areas now face development pressures, the decisions made today about future land development will have tremendous impact on Florida's development patterns, transportation needs, and associated energy consumption over the next several decades. A statewide analysis by 1000 Friends of Florida projected that, under current trends, the amount of developed land in the state would more than

double by 2060, increasing by nearly 11,000 square miles. The results of this analysis are presented in the following maps.

Current and Projected Development Patterns



Florida's Response

Key strategies for reducing transportation's contribution to GHG emissions include:

- Reducing the rate of fuel consumption by enhancing vehicle efficiency;¹⁰
- Reducing congestion and delay on the transportation system;
- Reducing the carbon content of fuel, so that fewer emissions are generated for each gallon of fuel consumed;
- Reducing the growth rate in travel by managing travel demand; and
- Expanding options for travel by means other than single-occupant vehicles, and changing land use patterns.

Increasing transportation system efficiency

Reducing congestion and delay on the highway system enables vehicles to operate at higher efficiency, as well as reduce fuel consumption and associated emissions. The DOT and regional and local transportation agencies are developing and implementing strategies to reduce congestion and delay, such as:

- Eliminating or alleviating physical bottlenecks, which account for about 40 percent of all delay nationwide;
- Improving the response to and management of traffic around crashes and other incidents;
- Improving traffic management in construction work zones and during special events;
- Improving signal timing;

¹⁰ This issue is being addressed by Executive Order Number 07-127 which directs DEP to develop rules to adopt the California motor vehicle emission standards.

- Implement electronic toll collection and open road tolling so vehicles do not need to stop at toll plazas; and
- Provide real-time traffic information to enable drivers to make informed decisions about where, when, and how to travel.

Reducing growth in travel

Reducing the growth rate in travel can significantly leverage the gains achieved through fuel efficiency, alternative fuels, and transportation system efficiency. Key strategies include:

Transportation demand management includes a broad set of commuter measures designed to reduce VMT for trips to work. Current strategies include telecommuting; compressed work weeks; flexible work hours; employer-provided transit benefits, ride-matching, and guaranteed ride home programs. In addition, changes in the provision and pricing of parking can encourage drivers to use other means of travel and reduce their number of vehicle trips.

Providing modal options such as enhanced rail, transit, bicycle, and pedestrian systems can reduce the number of trips on the highway system. The state's Transit New Starts Program is advancing commuter rail, light rail, bus rapid transit, and streetcar projects in Central Florida, Jacksonville, Miami, and Fort Lauderdale. Intercity passenger rail investments, such as the planned Central Florida Commuter Rail service and expansion of the South Florida Regional Transportation Authority (Tri-Rail) service will also encourage use of other travel options.

Pricing strategies can reduce congestion, shift trips to other modes, and reduce the VMT growth rate, particularly during peak periods. The "I-95 Express" project in Miami-Dade and Broward counties will develop express lanes along Interstate 95 for travelers willing to pay a toll and for transit vehicles. Toll rates will vary based on time-of-day and traffic conditions.

Freight-specific strategies that include initiatives to (1) provide modal options such as freight rail, coastal barge, and short-sea shipping; (2) alleviate freight-specific bottlenecks, such as on the connectors between highways and seaports and airports; (3) reduce truck idling through anti-idling ordinances, truck stop electrification, and expanded truck parking; and reduce the number of empty backhauls by trucks.

Changing land use patterns

Development of land use policies occurs at all levels of government – state, regional, and local. Land use changes generally are made at the local level through the adoption of local government comprehensive plans (which include binding future land use maps) and related changes in zoning and other ordinances, as well as development practices. In addition, the 11 regional planning councils develop Strategic Regional Policy Plans that identify regionally significant resources and coordinate policies across jurisdictions.

Changing land use patterns can reduce the growth rate in VMT by enabling people to make fewer trips, make shorter trips, or use alternative modes. Land use outcomes that

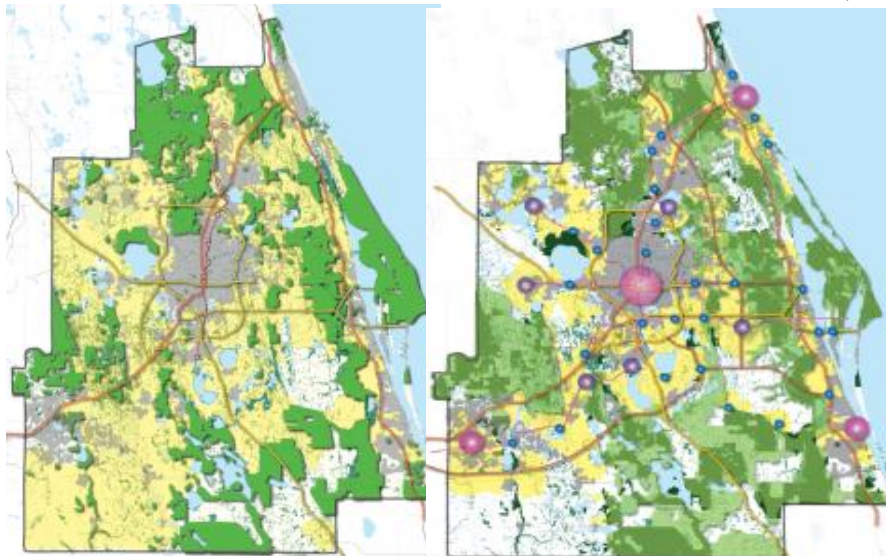
typically are associated with reducing the growth of VMT include compact development, infill and urban redevelopment, the integration of complementary land uses so people can live, work, and shop in close proximity, and transit-oriented development. A recent national study suggested that such growth strategies could reduce carbon dioxide emissions by seven to ten percent by 2050, compared to continuing current growth practices. At the metropolitan level, compact development can reduce VMT by 20 to 40 percent relative to a comparable amount of development on the suburban edge.¹¹

Increasingly, long-range visioning activities in Florida at the community and regional levels are identifying alternatives to current growth practices. A regional vision enables a comprehensive approach to planning for future land uses, transportation, conservation, economic development, housing, and other community needs across community boundaries.

For example, a seven-county regional visioning initiative in Central Florida was convened to answer the question "How Shall We Grow?" The process evaluated four alternative scenarios that reflected different combinations of decisions about land use, urban form,

conservation, and transportation. Central Florida residents gave a resounding no to the trend of growth, preferring options such as clustering development in city and town centers with multimodal transportation corridors. These changes could

lead to an eight percent reduction in VMT and a 14 percent reduction in emissions in 2050, compared to the trend of growth.



East Central Florida development in 2050 under the current trend (left) vs. Centers (right) scenarios. Yellow represents urbanized land.

¹¹ Urban Land Institute, "Growing Cooler: The Evidence on Urban Development and Climate Change," October 2007.

Action Team Findings and Recommendation for Charge:

- a. Finding: The Action Team finds that the transportation sector accounts for 46% of the carbon dioxide greenhouse gas emissions in Florida and that between 2006 and 2050 the daily vehicle miles traveled is forecast to increase by 240% based on current trends.
- b. Finding: The Action Team finds that strategies for relieving congestion, providing travel alternatives to automobiles, and integrating transportation and land use planning to produce compact and transit-oriented development can reduce the growth rate of vehicle miles traveled.
- c. Finding: The Action Team finds that reducing the greenhouse gases associated with vehicle miles traveled and congestion includes key strategies such as transportation demand management, providing modal options, pricing strategies, and freight-specific strategies.
- d. Finding: The Action Team finds that transportation revenues are largely dependent on motor fuel consumption; increases in vehicle fuel efficiency and alternative fuels may reduce transportation revenue. This increase in efficiency may increase vehicle miles traveled.
- e. Recommendation: The Action Team recommends that greenhouse gas emission reduction strategies be incorporated into state, regional, and local growth management and transportation planning processes.
- f. Recommendation: The Action Team recommends that Florida establish growth policies that require or provide incentives for developing regional visions that integrate transportation and land use planning to provide for sustainable growth and reduce greenhouse gas emissions.
- g. Recommendation: The Action Team recommends research on the impact of greenhouse gas emission reduction strategies on transportation revenue sources and alternative ways to fund transportation that create incentives to drive less.
- h. Recommendation: The Action Team recommends that state, regional, and local governments establish growth policies that:
 - In urban areas promote compact, transit-oriented development.
 - In rural areas balance the needs for economic development; promotion of agriculture; protection of natural resources; and preservation of rural character while avoiding urban sprawl.
 - Promote energy efficient mass and rail transit wherever feasible as well as strategies to ease the movement of freight in more GHG-efficient ways.
- i. Recommendation: The Action Team recommends that policies be developed which promote the use of low carbon vehicles.

Action Team Charge: Strategies for increasing the amount of renewable transportation fuels and for reducing the carbon content of fuels, such as a low carbon fuel standard

Current transportation fuel needs are approximately 28.7 million gallons per day, excluding aviation fuels. Motor gasoline and diesel fuel, both fossil fuels, make up more than 87 percent of Florida's transportation energy costs, with aviation fuel accounting for less than ten percent. Presently, automobiles and light duty trucks (trucks weighing 8500 pounds or less) account for approximately 95 percent of the CO₂ emissions from gasoline combustion. For emissions from diesel combustion, heavy-duty trucks account for approximately 78 percent, and ships and boats account for approximately ten percent. In 10 years, Florida's transportation fuel demand is expected to increase to 32.3 million gallons per day, assuming a 15 percent increase in the state's population.

Petroleum-based fuels remain the working fuel of Florida's transportation sector; however, alternative fuel initiatives have gained momentum in recent years. For example, as part of the Energy Policy Act of 2005, the Renewable Fuels Standard Program (RFS) required the blending of four billion gallons of renewable fuel with gasoline in 2006 and will be expanded up to at least seven and a half billion gallons by 2012. The inevitable transition from Florida's petroleum-based fuel supply of today, to a more diverse fuel mix that includes significant volumes of renewables, will involve pursuing multiple resources. These include biodiesel, ethanol, hydrogen, and biogas fuels, and electricity derived from solar, wind, geothermal, waste heat, hydroelectric, and ocean energy.

Biodiesel

Biodiesel is a biodegradable transportation fuel for use in diesel engines that is produced through processing of organically derived oils or fats. Biodiesel is typically used as a small blending (five percent to 20 percent) component with diesel fuel. In the future it may supplement diesel fuel supplies in more significant volumes than the current levels (less than one percent of the diesel supplies) both in Florida and nationwide.

In Florida, a multi-feedstock biodiesel plant in Lakeland has the capacity to produce 18 million gallons annually and will eventually produce up to 30 million gallons. Although this plant is currently closed, a niche market for biodiesel in Central Florida is growing. Most of the Lakeland plant's biodiesel has been sold out of state. A second biodiesel facility, located in Dade City, will have the capacity to produce 20-30 million gallons per year from chicken fat, cottonseed, soybean oils, algae oils, or other seed crops when it becomes fully operational. The potential capacity of this facility will eventually be 120 million gallons per year, according to the company. A number of other producers are making small quantities of biodiesel from recycled cooking oil in various locations

across Florida. These biodiesel production rates do not yet compare to current diesel consumption in Florida of about two billion gallons per year.

Storage capacity for imported biodiesel is expected to grow. In order to make biodiesel more available to retailers around the state, one of the best places to locate biodiesel storage tanks is at the fuel terminals where diesel is supplied. The maximum GHG reductions are obtained by supplementing Florida's diesel supply with biodiesel produced within the state.

The National Biodiesel Board currently lists 26 companies as distributors of biodiesel throughout Florida. Currently, biodiesel is available at 11 fueling stations which are open to the public.

Ethanol

Ethanol, also known as ethyl alcohol or grain alcohol, is a flammable, colorless chemical compound and one of the alcohols that is most often found in alcoholic beverages. Ethanol is also the most widely used renewable biofuel. It is made by converting starch crops into sugars, and fermenting the sugars into ethanol which is then distilled into its final form. Its main uses are to enhance vehicle performance (octane boosting) and as a fuel oxygenate to improve the emissions profile of gasoline (in areas requiring reformulated gasoline, such as Atlanta).

Currently most (97 percent) of the ethanol produced in the U.S. is made from corn. Dedicating all U.S. corn and soybean production to biofuels would meet only 12 percent of gasoline demand and six percent of diesel demand.¹² Florida is pursuing cellulosic ethanol technologies to produce ethanol from Florida-based biomass like sugarcane byproducts (bagasse) or citrus peels.

According to Florida's DACS, there is an estimated 124 million dry tons of biomass available in Florida to make upwards of seven to 12 billion gallons of cellulosic ethanol. A number of factors limit Florida's ability to fully capitalize on this opportunity though, such as the prohibitive cost of hauling biomass long distances and the large volumes of water needed to make ethanol. On average, it takes approximately five gallons of water to produce one gallon of ethanol derived from corn. Thus, it would take approximately 60 billion gallons of water to fully capitalize on the production of ethanol in Florida. Fortunately, newer production facilities are being designed to minimize water use through new technologies and water reuse. While chemically identical to ethanol produced from corn, cellulosic ethanol exhibits a net energy content significantly higher than corn ethanol.¹³

¹² Environmental, economic, and energetic costs and benefits of biodiesel and ethanol biofuels. Jason Hill, Erik Nelson, David Tilman, Stephen Polasky, and Douglas Tiffany, June 2, 2006

¹³ http://www.harvestcleanenergy.org/enews/enews_0505/enews_0505_Cellulosic_Ethanol.htm.

Current studies indicate that ethanol produced from corn is much less petroleum-intensive to manufacture than originally believed. However, corn ethanol does have GHG emissions similar to those of gasoline.¹⁴ The life cycle assessment for cellulosic ethanol showed GHG emission reductions of about 80 percent more than gasoline.¹⁵ Cellulosic ethanol has been proven in the laboratory but not demonstrated on a commercial scale yet. One barrier appears to be the willingness of the financial sector to invest capital in an unproven technology. Production costs of cellulosic ethanol are estimated to be about twice that of corn-based ethanol at this stage of development.

The demand for E85 ethanol (85% blend of ethanol) has been driven largely by the federal Energy Policy Act of 1992, which required that public and private vehicle fleets operated within selected Metropolitan Statistical Areas acquire Alternative Fuel Vehicles (AFV). Florida contains nine designated Metropolitan Statistical Areas in which the Energy Policy Act standards apply.

Currently, there are nearly 50 ethanol fueling stations selling E10 (a 10% blend of ethanol) in Florida open to the public and four ethanol distributors / haulers serving demand in Florida. E10 can be used in any car without modification. Florida currently has no operational ethanol production plants in the state; however, there are plans for two commercial facilities producing corn-based ethanol in the Tampa area with a combined production capacity of 75 million gallons per year. Three pilot projects funded partially by state funds will produce ethanol from waste materials such as citrus processing waste, yard, wood, and vegetative wastes. Florida ethanol supplies are currently obtained by imports from refineries outside of the state. Because corn-based ethanol production has scaled up in recent years due to the federal renewable fuels mandate (7.5 billion gallons ethanol by 2012), there is currently an abundance of ethanol in the Midwest. To take advantage of the current situation, Florida distributors are seeking to triple the current volume of ethanol in the state in the near future. This would expand the current sale of E10 and bring statewide ethanol/gasoline ratio to about 1 percent.

Hydrogen

Hydrogen as an energy carrier is an attractive motor fuel, but commercial scale deployment is not likely until 2025. Initially, government will play a key role in conducting the research and development to achieve the "technology readiness" needed to allow industry to make decisions on commercialization. Through public-private partnerships, Florida has been able to demonstrate hydrogen technologies in real-world applications.

¹⁴ *Ethanol Can Contribute to Energy and Environmental Goals*, Science Magazine, 1/27/06.

¹⁵ http://www.harvestcleanenergy.org/enews/enews_0505/enews_0505_Cellulosic_Ethanol.htm

Two hydrogen fueling stations are operating in Orlando, and another station is in the planning stage. These stations produce hydrogen fuel on-site and service the state of Florida's hydrogen vehicle fleet which consists of six fuel cell vehicles and eight hydrogen internal-combustion engine shuttle buses.

There are several technological issues associated with hydrogen's use as a transportation fuel that must be addressed before it can be incorporated into Florida's transport fuel portfolio. Hydrogen production is expensive – the best source is currently reformed natural gas. The net energy benefit improves when hydrogen is derived from hydrolysis of water using solar power or other renewable resources. Hydrogen, being a gas, presents challenges for storage as the container makes up most of the weight by volume. Since hydrogen is a gas, its safety issues are different from liquid fuels. Unlike accidents involving gasoline fires, hydrogen fires would occur above the vehicle. Onboard storage of sufficient quantities of hydrogen to approximate the range of current vehicles is proving to be a major challenge.

One of the strategies for long-term hydrogen fuel infrastructure is to develop a compressed natural gas infrastructure. Compression and storage of natural gas is closely related to facilities needed for hydrogen, and blends of compressed natural gas (CNG) and hydrogen are capable of improving the already lower GHG emissions from CNG vehicles. Car makers currently market CNG dedicated cars, like the Honda Civic-GX, and consumers can purchase an appliance to fill their fuel tanks at home.

Electricity

Today, Americans driving gas or diesel powered vehicles spend about 12 cents per mile for fuel. The driver of a Plug-In Hybrid Electric Vehicles (PHEV) would only spend about three cents per mile.¹⁶ Electric vehicle operation is clean, quiet, largely independent of imported petroleum, and highly amenable to using solar or other renewable energy generation.

Perhaps the biggest challenge PHEVs have is the cost and weight of batteries. Even at today's battery costs, plug-ins may be able to repay their costs within a few years. Another challenge to the success of electric vehicles has been their limited range. With hybrid-electric technology, however, that challenge can now be readily overcome. Add extra batteries to a hybrid electric vehicle and a way to plug them in and most of a typical day's mileage can be driven on clean, less expensive electricity but still have an easily refillable fuel tank for longer trips.

Researchers are also seeking to carry the PHEV concept a couple steps farther by making the plug-in reversible. Called a "vehicle-to-grid" or "V2G," such a two-way plug allows the home and vehicle owner and local utility to take advantage of the extra electrical

¹⁶ United States Department of Energy, National Renewable Energy Laboratory

storage capacity in the vehicle batteries to meet peak demand, provide grid support services, or respond to power outages. In addition, utilities pay premium rates for peak and backup power and might pay commuters to plug their vehicles in while at work to ensure their employers have high quality power throughout the day.

Several Florida cities, counties, and businesses are at the forefront of promoting PHEVs. In 2006, Sarasota County was designated the nation's first "Renewable Community" as part of a demonstration project by the National Renewable Energy Laboratory of the United States Department of Energy. The Renewable Community project combines renewable based energy systems for transportation, such as plug-in PHEVs, and residential/commercial buildings to reduce the community's dependence on fossil fuels. Also, Miami-Dade County, Sarasota County, the City of Tallahassee, the City of Miami as well as several Florida businesses have partnered with "Plug-In Partners," a national grassroots campaign formed to demonstrate the demand and market for PHEVs to automobile makers.

Emerging Renewable Transportation Fuels

Biobutanol is fuel alcohol that can be produced from the same agricultural feedstocks as ethanol (e.g. corn, sugar and sweet sorghum); however, biobutanol has several advantages over ethanol. To start, it can be used in the petroleum industry's existing distribution infrastructure without requiring modifications in blending facilities, storage tanks or retail station pumps. Biobutanol also has an energy content closer to that of gasoline than ethanol so consumers face less of a compromise on fuel economy. Although research and development continue, BP and DuPont expect to make commercial volumes of biobutanol for market by the end of 2007.¹⁷

Another emerging biofuel is renewable diesel. Renewable diesel can be produced from renewable plant and/or animal feedstocks, but it is not chemically similar to biodiesel. Production technologies are still in the early stages of commercialization, but preliminary performance and emissions testing show favorable results. One product has been registered by the US EPA as a fuel or fuel additive, a specific requirement prior to introduction as a commercial product. Conoco-Philips and Tyson Foods have announced that they will begin production in the U.S. in 2007, producing up to 175 million gallons of fuel by 2009.¹⁸

There are other technologies for producing low carbon fuels that require further research and development.

¹⁷ http://www2.dupont.com/Biofuels/en_US/

¹⁸ *Renewable Diesel Technology*, Renewable Diesel Subcommittee of the WSDA Technical Work Group, Washington State Department of Agriculture, July 25, 2007

Tax Incentive Programs

The Florida legislature has created three tax incentives programs to stimulate the development in alternative fuels such as hydrogen, biodiesel, ethanol, their associated facilities, and the production of electricity from renewable energy sources.

The first program is a statewide Sales Tax Incentive of up to \$2 million for each fiscal year for Florida citizens that invest in hydrogen-powered vehicles, materials incorporated into hydrogen powered vehicles, and hydrogen-fueling stations. An additional \$1 million in tax each state fiscal year for all taxpayers has been allocated to provide incentives to commercial stationary hydrogen fuel cells, and an additional \$1 million in sales tax paid for materials used in the distribution of biodiesel (B10-B100) and ethanol (E10-100), including fueling infrastructure, transportation, and storage. Also qualifying for the exemption are gasoline fueling stations pump retrofits for ethanol (E10-E100) distribution.

The Infrastructure Investment Tax Credit Program provides hydrogen investors up to seventy-five percent of all their capital costs, operation and maintenance costs, and research and development costs up to a limit of \$3 million per state fiscal year for all taxpayers. These costs must be in connection with an investment in hydrogen-powered vehicles and hydrogen vehicle fueling stations. An additional allocation within this program is available to those investing in commercial stationary hydrogen fuel cells and they qualify for tax credits up to seventy-five percent of all their capital costs, operation and maintenance costs, and research and development costs up to a limit of \$1.5 million per state fiscal year for all taxpayers, and limited to a maximum of \$12,000 per fuel cell. A third allocation provides seventy-five percent of all capital costs, operation and maintenance costs, and research and development costs up to a limit of \$6.5 million per state fiscal year for all taxpayers, in connection with an investment in the production, storage, and distribution of biodiesel (B10-B100) and ethanol (E10-E100). To date, one application has been approved for nearly \$3.2M.

The Florida Renewable Energy Production Tax Credit is administered by the Department of Revenue (DOR) and is intended to encourage the development and expansion of facilities in Florida that produce electricity from renewable energy. The law provides a corporate income tax credit equal to one cent (\$0.01) for each additional kilowatt hour of electricity produced from renewable energy sources at a new or expanded Florida facility. DOR has been allocated \$5 million per year in corporate income tax credits to support this program.

Action Team Findings and Recommendation for Charge:

- a. Finding: The Action Team finds that the market for renewable biofuels in Florida requires performance-based policy and standards to stimulate investments to accelerate production and market-driven, state-wide distribution.

- b. Finding: The Action Team finds that there is a need to conduct life cycle assessment of transportation fuels and analyses of resources required for sustainability.
- c. Finding: The Action Team finds that other potential renewable transportation fuels require continued research and development prior to commercialization.
- d. Finding: The Action Team finds that a self-sustaining renewable fuels industry using feedstocks derived from Florida biomass can improve energy diversity and security, increase farm income, and create new jobs in Florida.
- e. Recommendation: The Action Team recommends continued funding for research, development and technology demonstration for a full range of renewable transportation fuels.
- f. Recommendation: The Action Team recommends continued support for existing tax incentives in Florida Statute for alternative transportation fueling infrastructure development in Florida.
- g. Recommendation: The Action Team recommends the development of life cycle analyses of transportation fuels and the use of those analyses to determine appropriate pathways to protect natural resources required for sustainability.
- h. Recommendation: The Action Team will continue to evaluate the option of a low carbon fuel standard including exploring opportunities for a regional standard with other southern states.

Florida's Government Sector

Action Team Charge: Policies to reduce greenhouse gas emissions from state and local governments not addressed in Executive Order 07-126

By signing Executive Order 07-126, Governor Crist committed Florida to becoming a leader in reducing GHG emissions from state government. For agencies and departments under the Governor's purview, Executive Order 07-126 established GHG emission reduction targets of ten percent below current emissions by 2012; 25 percent below current emissions by 2017; and 40 percent below current emissions by 2025.

During Fiscal Year 06-07, state agencies¹⁹ emitted 899,292 metric tons of CO₂, or approximately 0.34 percent of the 265 million metric tons of total statewide CO₂ emissions in 2004. The total emissions from Florida state government were equivalent to the annual CO₂ emissions from 194,652 passenger cars, the electricity usage from 115,442 households, or consumption of 2,091,377 barrels of oil. Of the total CO₂ emissions from state agencies, the majority (84 percent) came from the generation of purchased electricity used in facilities with the remainder (16 percent) from fuel burned in vehicle usage. Because state government is among the largest employers in Florida with 114,756 authorized employees, more than \$1 billion in annual commodity purchases, and 16.8 million square feet of office space statewide, state government has the unique opportunity to "lead by example" in reducing GHG emissions.

Specifically, Executive Order 07-126 directed the following actions be taken within three distinct areas of state government to ensure the required emissions reductions are met.

State Government Operations

1. Develop the Florida Climate Friendly Products List;
2. Conduct GHG emissions assessment (for both facilities and fleets);
3. Incorporate best possible environmental performance in rental car state term contract; and
4. Incorporate energy consumption and GHG emissions as performance criteria in outsourcing projects business cases.

¹⁹ Those agencies reporting include: Agency for Health Care Administration, Agency for Persons with Disabilities, Agency for Workforce Innovation, the Departments of Agriculture and Consumer Services, Business and Professional Regulation, Children and Families, Citrus, Community Affairs, Corrections, Education, Elder Affairs, Environmental Protection, Financial Services, Health, Highway Safety and Motor Vehicles, Juvenile Justice, Law Enforcement, Legal Affairs, Lottery, Management Services, Military Affairs, Revenue, State, Transportation, Veteran Affairs, the Executive Office of the Governor, the Wildlife Conservation Commission, Northwest Florida Water Management District, Public Service Commission, South Florida Water Management District, Southwest Florida Water Management District, St. Johns River Water Management District, State Board of Administration, Suwannee River Water Management District

State Government Facilities

1. Adopt US Green Building Council's Leadership in Energy and Environmental Design (LEED) standards for both new construction and existing buildings;
2. Enter into new leases with ENERGY STAR rated facilities where viable;
3. Develop energy conservation measures and guidelines for facilities;
4. Prioritize implementing LEED-EB standards; and
5. Contract with only DEP Florida Green Lodging designated meeting facilities; and
6. Develop and implement a model solar project.

State Government Fleet

1. Certify that all vehicles are meeting maintenance schedules;
2. Provide inventory of alternative motor vehicle fueling facilities;
3. Analyze Governor's agencies' average fuel economy by vehicle class;
4. Provide state vehicle fuel usage by Metropolitan Statistical Area to demonstrate potential biofuel demand to industry;
5. Approve only new vehicles with the greatest fuel efficiency in class;
6. Determine feasibility of opening state-owned alternative fuel facilities to private fleet / public; and
7. Use biodiesel and ethanol fuels when locally available.

When combined, the actions required under Executive Order 07-126 offer an integrated energy and environmental impact strategy. This integrated strategy to address energy usage and environmental impact offers new opportunities for increased energy efficiency, multi-pollutant prevention, and environmental improvements as well as greater operational efficiency.

As the actions required in Executive Order 07-126 have been implemented, several opportunities have been identified as ways to ensure the required GHG reductions are fully met. In order to fully track the GHG emission reductions and cost savings associated with investment in energy conservation and efficiency, there needs to be accurate information collected across all state government. Next, the purchased electricity used in facilities has been shown to contribute the majority of GHG emissions related to state government. Additionally, the operation and maintenance expenditures associated with energy equipment in facilities represent a substantial cost. The key to reducing the electricity usage and associated costs in newly constructed facilities is to incorporate energy conservation measures in the design phase. Similarly, in existing buildings, capital upgrades and investment to the energy equipment can significantly reduce the GHG emissions as well as the associated operation and maintenance costs.

By extension, the actions outlined in Executive Order 07-126 are equally as effective across local governments as they are across state agencies. For example, the Florida

Green Local Government Standard is an initiative to bring together entities with common objectives and overlapping interests to develop integrated energy/environmental solutions to statewide as well as local issues. As such, the Green Local Government Standard designates Green Cities and Green Counties for outstanding environmental stewardship. Like Executive Order 07-126, the Florida Green Local Government Standard takes an integrated approach to energy and environmental solutions. This standard presents a comprehensive list of criteria, organized in terms of local government department functions. It focuses on improving environmental performance through a number of mediums (energy, water, air, land, and waste), and evaluates environmental practices done "in-house," incentives and ordinances to foster green practices, and educational activities to improve the environment.

Action Team Findings and Recommendation for Charge

- a. Finding: The Action Team finds that an integrated approach to energy and environmental solutions is appropriate at all levels of government.
- b. Finding: The Action Team finds that operating and maintenance expenditures associated with energy equipment and with energy consumed in buildings represent a significant cost over the life of a building.
- c. Finding: The Action Team finds that investment in energy conservation measures in facilities can reduce the amount of energy consumed and produce immediate and long term savings.
- d. Finding: The Action Team finds that energy conserved by appropriate building design not only reduces the demand for energy but also reduces costs for building operation.
- e. Finding: The Action Team finds that the efforts of the Florida Green Building Coalition, Inc. through their Government Green Standards program are valuable and encourages municipalities, counties and schools to participate in the Green City and Green County initiatives or similar applicable standards.
- f. Recommendation: The Action Team recommends that the appropriate actions required by Executive Order 07-126 be extended by statute to all state government operations.
- g. Recommendation: The Action Team recommends specific legislative authority to remove barriers precluding the use of energy performance savings contracts for use in state government facilities.
- h. Recommendation: The Action Team recommends incentives to assist municipalities, counties and schools in the development of programs that achieve the Green Standards and designation or similar applicable standards, involve cost-efficient solutions, improve quality of life, and strengthen Florida's economy

Organizing State Government for Florida's Energy Future

Action Team Charge: Strategies and mechanisms for the consolidation and coordination of energy policy in Florida

There are a number of organizations within the State of Florida's government that actively participate in shaping or implementing Florida's energy policy. In examining these organizations, it is helpful to differentiate between policy roles, regulatory roles, non-regulatory program implementation roles, research & development roles, and market development and promotional roles. Appendix E provides more detail on the agencies and their energy programs.

Policy Development Roles

The Florida Legislature is the state's pre-eminent policy setting body consistent with Florida's Constitution. The energy related issues outlined in this report are spread across the jurisdiction of seven committees in the Florida Senate and a dozen committees in the Florida House of Representatives. The Florida Energy Commission advises the House and Senate with an annual report containing recommendations.

Within Florida's executive branch of government, the principal policy role is held by the Governor and supported by the 16 agencies that report directly to the Governor. In addition, the Governor and Cabinet sitting as the Utility Siting Board serve as a policy-making body in approving or denying the certification of electric generation and transmission facilities. The decisions of the Utility Siting Board may appear to be purely regulatory, but any technologies, fuel sources or locations approved by that board will affect the long-term capital allocation decisions made by Florida's utilities which, in turn, set long-term investment policy.

Regulatory Roles

There are six state agencies with regulatory roles affecting energy in Florida: the PSC, the DACS, the DEP, the DCA, the DOT and the Department of Revenue (DOR).

The PSC is charged with the economic regulation, reliability and safety of Florida's investor-owned utilities. The DACS houses the Bureau of Petroleum Inspection which regulates the quality and measurement of petroleum products sold in Florida. The DEP administers the environmental programs with respect to energy production, permitting, siting, air pollution control, and the promotion of renewable energy via grants and rebates. The Florida Energy Office is located within DEP. DCA administers appliance efficiency standards and the energy code. The DOT oversees the development and regulation of state-owned roads and the agency's policy decisions can affect the use of vehicle fuels in Florida. The DOR administers a renewable energy production corporate tax credit program and renewable energy sales tax exemption program.

Program Implementation Roles

In addition to their regulatory roles, several state agencies implement programs to educate citizens on conservation efforts, to encourage investment in conservation equipment and to provide weatherization assistance. These programs encourage conservation and efficiency behavior through an economic inducement instead of a penalty. Through its web site and public outreach, the PSC provides information to educate consumers on ways to conserve and invest in energy efficient appliances.

The DCA and DEP administer programs to assist low-income and elderly residents and provide grants and rebates to promote conservation. The DCA is the principal clearinghouse for growth management and administration of state and federal energy and conservation grant programs allocated for use at the community level. DCA administers two particular programs that provide grant funding to low-income residents, the Weatherization Assistance program and the Low Income Home Energy Assistance Program. DEP through the Florida Energy Office administers the promotion of renewable energy via grants, rebates and tax incentives. The DOR administers an incentive program which provides a corporate income tax credit based on electricity produced from renewable energy sources at new or expanded Florida facilities.

Research and Development Roles

Florida's principal research and development functions are housed within the State University System administered by the Board of Governors. There are 14 centers within seven universities working directly on advanced energy technologies. This does not include other institutes focused on materials science and other disciplines that have important applications within the energy sector.

The DACS and the DEP also support research, development, and technology demonstration efforts within university settings as well as with emerging entrepreneurs through the Farm to Fuel grant program and the Renewable Energy Grant Program, respectively.

Market Development and Promotional Roles

The final role within Florida's energy sector is to promote new energy products and services within Florida and to find outside markets. Under the Governor's Office of Trade Tourism and Economic Development is a public/private consortium that promotes industry and economic development in Florida, called Enterprise Florida. Enterprise Florida has identified energy as a qualifying targeted industry (QTI) and QTIs are industries Florida would like to attract and retain because they provide high paid skilled jobs. QTI companies with more than 75 employees qualify, through Enterprise Florida, for a number of economic development incentives including training and tax incentives.

Another organization that leverages funding from federal, state, and private resources to develop and implement technology-based programs is the Technology Research and Development Authority (TRDA), an independent special district of the state. It focuses its programs across four targeted areas: education, business incubation, energy, and technology transfer.

Action Team Findings and Recommendation for Charge:

- a. Finding: The Action Team finds that energy and climate change planning must be coordinated if Florida is to meet its climate change, energy security and economic development goals.
- b. Finding: The Action Team finds that state government should set clear, positive, and consistent energy and climate change policies in order to encourage capital investment in Florida's energy sector.
- c. Recommendation: The Action Team recommends further examination of ways the state can support the public and private efforts to develop alternative fuels and technologies in Florida.
- d. Recommendation: The Action Team recommends consideration of an organizational model that fosters greater public-private cooperation for the development of a low-carbon energy market in Florida.

Blueprint for Florida's Final Climate Action Plan

Action Team Charge: Additional greenhouse gas emission reduction strategies beyond those directed in Executive Order 07-127, as well as an overall blueprint for development of actions

The Action Team has read the second charge of Executive Order 07-128 calling for a "blueprint" for further emission reduction policies as an opportunity to develop a stakeholder process to address key issues identified in this first phase of the Action Team's report as well as issues that will be addressed in 2008.

In addition to six new items within the Action Team charge for 2008, the following were identified as subject matter requiring further analysis and deliberation in 2008:

1. Design considerations for an emissions allowance trading program as a means of implementing regulatory emission caps on electric utilities as directed under Executive Order 07-127;
2. Design considerations for policies to increase energy efficiency and conservation in Florida as strategies to reduce future GHG emissions, manage adverse economic impacts to low-income Floridians and small businesses, and create new economic opportunities;
3. Further examination of various energy technologies and their roles in reducing carbon emissions while assuring reliable energy for Florida;
4. Further examination of the impact of greenhouse gas emission reduction policies within the transportation sector on revenue sources for transportation infrastructure;
5. Further consideration of a low carbon fuel standard within Florida or more broadly within the Southeast; and
6. Further consideration of an organizational model for state government energy programs that fosters greater public-private cooperation in the development of a low-carbon energy market in Florida.

In further examining these issues, the Action Team has indicated its support for a facilitated stakeholder process under the direction of the Action Team. This process will be guided by rigorous analysis of the costs and benefits of various policy options to include an examination of the costs of inaction. The Action Team believes that consumer costs to the people of Florida must be evaluated as an important criterion for assessing the specific policy recommendations, herein.

Action Team Findings and Recommendation for Charge:

- a) **Finding:** The Action Team finds that numerous other states and nations have developed comprehensive GHG emission reduction strategies through a facilitated stakeholder process resulting in a Climate Action Plan.

- b) Finding: The Action Team finds the development of such a Florida Climate Action Plan, as directed by Governor Crist in Executive Order 07-128, to be prudent in anticipation of further state climate change policy initiatives as well as possible federal legislation addressing climate change which will likely require state level planning.
- c) Recommendation: The Action Team recommends that the balance of its charge under Executive Order 07-128, in addition to specific future analytical endeavors specified in this document, be addressed within such a facilitated stakeholder process during 2008 to result in the Florida's Energy and Climate Change Action Plan due to the Governor on October 1, 2008.

NEXT STEPS FOR THE ACTION TEAM

Following the completion of this first phase of the Florida Energy and Climate Change Action Plan on November 1, 2007, the Action Team will begin preparing for the second phase. The Governor's Action Team on Energy and Climate Change will convene in January 2008 to begin deliberations on the following items from Executive Order 07-128:

1. Adaptation strategies to combat adverse impacts to society, public health, the economy, and natural communities in Florida;
2. Policies to reduce the increases in GHGs from new growth;
3. Carbon capture and storage technologies;
4. Land use and management policies that improve the long-term storage of carbon in Florida's biomass;
5. Strategic investments and public-private partnerships in Florida to spur economic development and climate-friendly industries and economic activity that reduces emissions in Florida; and
6. Strategies and mechanisms for the long-term coordination of Florida's public policy in the areas of economic development, university-based research and technology development, energy, environmental protection, natural resource management, growth management, transportation, and other areas as needed to assure a future of prosperity for Floridians in reducing GHG emissions.

APPENDIX A: EXECUTIVE ORDERS 07-126, 07-127, 07-128

On July 13, 2007, Governor Charlie Crist signed three Executive Orders to address global climate change. The text of these three Executive Orders is presented in this appendix.

Executive Order 07-126: Establishing Climate Change Leadership by Example: Immediate Actions to Reduce Greenhouse Gas Emissions from Florida State Government

WHEREAS, with nearly 1,350 miles of coastline and a majority of citizens living near that coastline, Florida is more vulnerable to rising ocean levels and violent weather than any other state; and

WHEREAS, global climate change is one of the most important issues facing the State of Florida this century; and

WHEREAS, Florida has committed to becoming a leader in reducing emissions of greenhouse gases which are changing Earth's climate; and

WHEREAS, immediate actions are available and required to reduce emissions of greenhouse gases within Florida; and

WHEREAS, Florida's state government is the largest employer within the State of Florida with 114,756 authorized employees, more than \$1 billion in annual commodity purchases, and 16.8 million square feet of office space statewide; and

WHEREAS, Florida's state government must lead by example in the fight against global climate change by reducing emissions of greenhouse gases and demonstrating the economic value of such reductions; and

WHEREAS, reductions in carbon emissions associated with state government operations will result in returns to the taxpayers of Florida through reduced energy costs; and

WHEREAS, such savings can fund strategic investments elsewhere in Florida's economy that further reduce emissions of greenhouse gases while boosting green industries in Florida.

NOW, THEREFORE, I, CHARLIE CRIST, as Governor of Florida, in obedience to my solemn constitutional duty to take care that the laws be faithfully executed, and pursuant to the Constitution and laws of the State of Florida, do hereby promulgate the following Executive Order, to take immediate effect:

Section 1. I hereby establish greenhouse gas emission reduction targets for state agencies and departments under the direction of the Governor as follows: a 10 percent reduction from current emission levels by 2012, a 25 percent reduction from current emission levels by 2017, and a 40 percent reduction from current emission levels by 2025.

Section 2. The Executive Office of the Governor shall track and report the resulting financial savings and emission reductions associated with this Executive Order with a Florida Governmental Carbon Scorecard. All state agencies and departments under the direction of the Governor are hereby directed to designate an individual responsible for coordinating implementation.

Section 3. I hereby direct the following actions to improve the climate performance of state government facilities:

1. Each state agency and department under the direction of the Governor is hereby directed to conduct an immediate assessment of energy used by agency facilities during FY 2006-2007 and to quantify the associated greenhouse gas emissions using the GHG Protocol Corporate Standard templates as developed by the World Business Council for Sustainable Development. The baseline assessment will be posted on Florida's Governmental Carbon Scorecard no later than October 1, 2007 and updated quarterly;
2. The Department of Management Services shall adopt the United States Green Building Council's Leadership in Energy and Environmental Design for New Construction (LEED-NC) standards for all new buildings. The Department is directed to strive for Platinum Level certification, the highest possible certification, for any new building constructed for or by the State of Florida;
3. The Department of Management Services shall immediately implement the United States Green Building Council's Leadership in Energy and Environmental Design for Existing Buildings (LEED-EB) for all buildings currently owned and operated by the Department on behalf of client agencies. The Department may prioritize implementation of LEED-EB standards in order to gain the greatest environmental benefit within the Department's existing budget for property management;
4. All state agencies and departments under the direction of the Governor are hereby precluded from entering into new leasing agreements for office space that does not meet Energy Star building standards, except when certified by the responsible agency head that no other viable alternative exists.
5. The Department of Management Services is hereby directed to develop energy conservation measures and guidelines for new and existing office space where state agencies occupy more than 20,000 square feet. These

conservation measures shall focus on programs that may reduce energy consumption and when established, provide a net reduction in occupancy costs. The Department shall develop and implement a model solar project for state-owned office buildings for future expansion.

Section 4. I hereby direct the following actions to improve the climate performance of state government procurement practices:

1. The Council for Efficient Government shall incorporate energy consumption and greenhouse gas emissions as performance criteria for all business cases evaluated by the Council in determining whether outsourcing projects are fiscally prudent for the State of Florida;
2. The Department of Management Services shall develop the "Florida Climate Friendly Preferred Products List." In developing the recommended list, the Department shall assess products currently available for purchase under State Term Contracts to identify specific products and vendors that have clear energy efficiency or other environmental benefit over competing products. The proposed list shall be provided to the Governor's Office no later than October 1, 2007;
3. Effective January 1, 2008 state agencies and departments under the direction of the Governor may not contract for meeting and conference space with hotels or conference facilities that have not received the DEP "Green Lodging" certification for best practices in water, energy, and waste efficiency standards, except when certified to the Governor by the responsible agency head that no other viable alternative exists..
4. The Department of Management Services, with assistance from the Department of Environmental Protection, shall develop bid criteria for the 2009 State Term Contract for Rental Vehicles that incorporate best possible energy efficiency and environmental performance. The Department shall seek to negotiate with the current vendor(s) to amend the contract(s) to incorporate these efficiencies.

Section 5. I hereby direct the following actions to improve the climate performance of state government fleets:

1. Each state agency and department under the direction of the Governor shall conduct an immediate assessment of transportation-related energy use and greenhouse gas emissions associated with agency operations. The assessment must include an analysis of the average fuel economy of each agency's automobiles and light trucks, by vehicle class. The results of this baseline assessment shall be posted on Florida's Governmental Carbon Scorecard, by agency, no later than October 1, 2007 and updated quarterly.
2. Each state agency and department under the direction of the Governor shall assure that within 30 days from the date of this order, all vehicles

are meeting minimum maintenance schedules shown to reduce fuel consumption which includes assuring appropriate tire pressures and tread; fuel filters and emission filters replaced at recommended intervals; proper motor oil; and timely motor tune-ups. The Department of Management Services shall measure and report compliance with this directive through the Equipment Management Information System database and reported to the Executive Office of the Governor on a semi-annual basis thereafter.

3. When procuring new vehicles, the Department of Management Services, through all state agencies and departments under the direction of the Governor, is directed to approve only those vehicles with the greatest fuel efficiency in a given class as required for that vehicle to minimize emissions of greenhouse gases. The Department shall consider any specific circumstances of law enforcement agencies in processing vehicle purchases and leasing agreements.
4. All state agencies and departments under the direction of the Governor shall use ethanol and biodiesel fuels when locally available. The Department of Management Services shall assess biofuel fueling potential by state government vehicles within each metropolitan statistical area to demonstrate demand for biofuels to industry. Agencies administering central fueling operations for state-owned vehicles are directed to procure biofuels for fleet needs to the greatest extent practicable.
5. The Department of Management Services, with assistance from the Department of Environmental Protection, shall document the extent of all alternative motor vehicle fueling facilities used by state government vehicles, including but not limited to hydrogen, compressed natural gas, biofuels, and electrically-charged batteries to determine the feasibility of opening current alternative fueling facilities to private sector fleets and the general public or developing such facilities in the future to increase public access to alternative vehicle fuels. The alternative motor vehicle fueling facility inventory shall be transmitted to the Governor's Office no later than October 1, 2007;

Section 6. The Department of Agriculture and Consumer Services, the Department of Financial Services, the Office of the Attorney General, all Governor and Cabinet agencies, the Florida Senate, the Florida House of Representatives, the Florida State Court System, the State University System, the Community College System, and other agencies of the state and commissions not under the jurisdiction of the Governor are encouraged to implement these and other actions to reduce State Government's overall emissions of greenhouse gases.

Section 7. All state agencies and departments under the direction of the Governor are hereby directed, and all other state agencies are hereby requested, to assist those carrying out the directions in this Executive Order.

Executive Order 07-127: Establishing Immediate Actions to Reduce Greenhouse Gas Emissions within Florida

WHEREAS, with nearly 1,350 miles of coastline and a majority of citizens living near that coastline, Florida is more vulnerable to rising ocean levels and violent weather than any other state; and

WHEREAS, global climate change is one of the most important issues facing the State of Florida this century; and

WHEREAS, Florida is the second fastest growing state in the union with respect to the annual increase of new greenhouse gas emissions; and

WHEREAS, immediate actions are available and required to reduce emissions of greenhouse gases within Florida; and

WHEREAS, efforts are underway at the national level to begin addressing greenhouse gas emissions; and

WHEREAS, Florida has committed to becoming a leader in reducing emissions of greenhouse gases which are causing changing Earth's climate; and

WHEREAS, Florida, together with international leaders and experts, is hosting the Serve to Conserve Climate Change Summit on July 12 and 13, 2007 in Miami, Florida;

NOW, THEREFORE, I, CHARLIE CRIST, as Governor of Florida, in obedience to my solemn constitutional duty to take care that the laws be faithfully executed, and pursuant to the Constitution and laws of the State of Florida, do hereby promulgate the following Executive Order, to take immediate effect:

Section 1. I hereby establish greenhouse gas emission reduction targets for the State of Florida as follows: by 2017, reduce greenhouse gas emissions to 2000 levels; by 2025, reduce greenhouse gas emissions to 1990 levels; by 2050, reduce greenhouse gas emissions by 80% of 1990 levels.

Section 2. I hereby direct the following actions by members of my Administration in order to produce immediate reductions in greenhouse gas emissions within Florida;

1. The Secretary of Environmental Protection shall immediately develop rules as authorized under Chapter 403, Florida Statutes, to achieve the following:

- Adoption of a maximum allowable emissions level of greenhouse gases for electric utilities in the State of Florida. The standard will require at minimum, three reduction milestones as follows: by 2017, emissions not greater than Year 2000 utility sector emissions; by 2025, emissions not greater than Year 1990 utility sector emissions; by 2050, emissions not greater than 20% of Year 1990 utility sector emissions (i.e., 80% reduction of 1990 emissions by 2050);
 - Adoption of the California motor vehicle emission standards in Title 13 of the California Code of Regulations, effective January 1, 2005, upon approval by the U.S. Environmental Protection Agency of the pending waiver, which includes emission standards for greenhouse gases, submitted by the California Air Resources Board; and
 - Adoption of a statewide diesel engine idle reduction standard.
2. The Secretary of Community Affairs shall immediately:
- Convene the Florida Building Commission for the purpose of revising the Florida Energy Code for Building Construction to increase the energy performance of new construction in Florida by at least 15% from the 2007 Energy Code. The Commission should consider incorporating standards for appliances and standard lighting in the Florida Energy Code. Target implementation date for the revised Florida Energy Code for Building Construction is January 1, 2009;
 - Initiate rulemaking of the Florida Energy Conservation Standards, Chapter 9B-44, Florida Administrative Code, with an objective to increase the efficiency of applicable consumer products authorized under s. 553.957, Florida Statutes, by 15% from current standards for implementation by July 1, 2009.

Section 3. I hereby request the Florida Public Service Commission to take the following actions for the electric utility sector in order to open the market to clean, renewable energy technologies, thus avoiding future greenhouse gas emissions:

- Not later than September 1, 2007, initiate rulemaking to require that utilities produce at least 20% of their electricity from renewable sources (Renewable Portfolio Standard) with a strong focus on solar and wind energy;
- Not later than September 1, 2007, initiate rulemaking to reduce the cost of connecting solar and other renewable energy technologies to Florida's power grid by adopting the Institute of Electrical and Electronics Engineers (IEEE) Standard 1547 for Interconnecting Distributed Resources with Electric Power Systems as the uniform statewide interconnection standard for all utilities; and
- Not later than September 1, 2007, initiate rulemaking to authorize a uniform, statewide method to enable residential and commercial customers who generate electricity from on-site renewable

technologies of up to 1 megawatt in capacity to offset their consumption over a billing period by allowing their electric meters to turn backwards when they generate electricity (net metering).

Section 4. All state agencies departments under the direction of the Governor are hereby directed, and all other state agencies are hereby requested, to assist those carrying out the directions in this Executive Order.

Executive Order 07-128: Establishing the Florida Governor's Action Team on Energy and Climate Change

WHEREAS, Florida has one of the nation's fastest growing populations with an average of 980 new residents arriving per day and approximately 84.6 million visitors per year; and

WHEREAS, as the fourth most populous state, Florida ranks third nationally in total energy consumption; and

WHEREAS, more than 70 percent of Florida's electricity is generated by fossil fuels which contribute to the state's carbon emissions; and

WHEREAS, Florida is encouraging alternative energy generation to promote energy diversity and reduce pollution; and

WHEREAS, with nearly 1,350 miles of coastline and a majority of citizens living near that coastline, Florida is more vulnerable to rising ocean levels and violent weather than any other state; and

WHEREAS, the potential impacts of climate change could significantly impact Florida's businesses, public infrastructure and disturb the way of life enjoyed by millions of Floridians; and

WHEREAS, global climate change is one of the most important issues facing Florida this century; and

WHEREAS, the actions Florida takes to reduce greenhouse gas emissions, in concert with actions taken elsewhere in the United States and the world, could significantly reduce the potential for adverse impacts in Florida; and

WHEREAS, Florida, together with international leaders and experts, is hosting the Serve to Conserve Climate Change Summit on July 12 and 13, 2007 in Miami, Florida;

NOW, THEREFORE, I, CHARLIE CRIST, as Governor of Florida, in obedience to my solemn constitutional duty to take care that the laws be faithfully executed, and pursuant to the Constitution and laws of the State of Florida, do hereby promulgate the following Executive Order, to take immediate effect:

Section 1. I hereby create the Florida Governor's Action Team on Energy and Climate Change to develop a comprehensive Energy and Climate Change Action Plan that will fully achieve or surpass Executive Order targets for statewide greenhouse gas reductions specified in Executive Order 07-127. Action Team members shall be gubernatorial appointees representing diverse expertise and stakeholder interests including, but not limited to, consumers, environment, business, industry, energy, state and local government, and academia. The Action Team shall hold its first meeting within 30 days of appointment.

Section 2. I hereby order the preparation of the Florida Energy and Climate Change Action Plan be guided by an evaluation of the possible consequences to Florida's environment, economy, and society from global climate change. The Florida Energy and Climate Change Action Plan shall include policy recommendations and necessary changes to existing law. The Florida Energy and Climate Change Action Plan shall be completed in two phases.

Phase I: By November 1, 2007, the Action Team shall issue recommendations including any necessary legislative initiatives to address the following:

1. Strategies and mechanisms for the consolidation and coordination of energy policy in Florida;
2. Additional greenhouse gas emission reduction strategies beyond those directed in Executive Order 07-127, as well as an overall blueprint for development of actions;
3. Policies to enhance energy efficiency and conservation, including statewide targets;
4. Market-based regulatory mechanisms, such as cap and trade programs, for use in efficiently reducing greenhouse gas emissions;
5. Strategies to diversify Florida's electric generation fuels to reduce greenhouse gas emissions and protect Florida's consumers from fuel price volatility;
6. Policies for emission reporting and registry that measure and document emission reductions;
7. Strategies for reducing the greenhouse gas emissions from motor vehicles;
8. Strategies for increasing the amount of renewable transportation fuels and for reducing the carbon content of fuels, such as a low carbon fuel standard;
9. Policies to reduce greenhouse gas emissions from state and local governments not addressed in Executive Order 07-126;
10. Policies to reward early emission reductions in advance of statewide or national greenhouse gas regulatory programs; and

11. Other policies for efficiently reducing emissions in Florida in conjunction with, or independent of regional, national, or international agreements.

Phase II: By October 1, 2008, the Action Team shall issue recommendations including any necessary legislative initiatives to address the following:

1. Adaptation strategies to combat adverse impacts to society, public health, the economy, and natural communities in Florida;
2. Policies to reduce the increases in greenhouse gas emissions from new growth;
3. Carbon capture and storage technologies;
4. Land use and management policies that improve the long-term storage of carbon in Florida's biomass;
5. Strategic investments and public-private partnerships in Florida to spur economic development around climate-friendly industries and economic activity that reduces emissions in Florida; and
6. Strategies and mechanisms for the long-term coordination of Florida's public policy in the areas of economic development, university-based research and technology development, energy, environmental protection, natural resource management, growth management, transportation, and other areas as needed to assure a future of prosperity for Floridians in reducing greenhouse gas emissions.

Section 3. The Secretary of the Department of Environmental Protection shall direct the professional staffing and assistance required by the Action Team in completing the Florida Energy and Climate Action Plan. The Department of Environmental Protection, the Department of Community Affairs, and the Department of Transportation shall provide staff and consultants, as required by the Secretary of the Department of Environmental Protection. The Public Service Commission and the Fish and Wildlife Conservation Commission are requested to provide assistance as required by the Secretary of the Department of Environmental Protection.

Section 4. Action Team members shall not be compensated for their services or reimbursed for travel or per diem expenses. Public officers and employees shall be reimbursed by their respective agencies in accordance with chapter 112, Florida Statutes.

Section 5. Public access to records generated by the Action Team and any technical advisory committees deemed necessary in furtherance of this order shall be governed by the Public Records Laws of Chapter 119, Florida Statutes. All meetings of the Action Team shall be governed by the Open Meetings Laws of Chapter 286, Florida Statutes.

Section 6. The Department of Environmental Protection shall provide administrative support necessary to implement the provisions of this Executive Order. All state agencies under the direction of the Governor are hereby directed, and all other state

agencies are hereby requested to assist those carrying out the directions in this Executive Order.

APPENDIX B: ACTION TEAM FINDINGS AND RECOMMENDATIONS SUMMARY

This appendix contains an overview of the Action Team's findings and recommendations for the November 1, 2007, charge contained within Governor Crist's Executive Order 07-128. The findings and recommendations within this summary are arranged under each of the 11 charges as numbered within the Executive Order.

- 1. Strategies and mechanisms for the consolidation and coordination of energy policy in Florida:**
 - a. Finding: The Action Team finds that energy and climate change planning must be coordinated if Florida is to meet its climate change, energy security and economic development goals.
 - b. Finding: The Action Team finds that state government should set clear, positive, and consistent energy and climate change policies in order to encourage capital investment in Florida's energy sector.
 - c. Recommendation: The Action Team recommends further examination of ways the state can support the public and private efforts to develop alternative fuels and technologies in Florida.
 - d. Recommendation: The Action Team recommends consideration of an organizational model that fosters greater public-private cooperation for the development of a low-carbon energy market in Florida.

- 2. Additional greenhouse gas emission reduction strategies beyond those directed in Executive Order 07-127, as well as an overall blueprint for development of actions:**
 - a. Finding: The Action Team finds that numerous other states and nations have developed comprehensive GHG emission reduction strategies through a facilitated stakeholder process resulting in a Climate Action Plan.
 - b. Finding: The Action Team finds the development of such a Florida Climate Action Plan, as directed by Governor Crist in Executive Order 07-128, to be prudent in anticipation of further state climate change policy initiatives as well as possible federal legislation addressing climate change which will likely require state level planning.
 - c. Recommendation: The Action Team recommends that the balance of its charge under Executive Order 07-128, in addition to specific future analytical endeavors specified in this document, be addressed within such a facilitated stakeholder process during 2008 to result in the Florida's Energy and Climate Change Action Plan due to the Governor on October 1, 2008.

- 3. Policies to enhance energy efficiency and conservation, including statewide targets:**
- a. Finding: The Action Team finds that energy conservation and energy efficiency are critical in enabling Florida to reach specific GHG emission reduction targets.
 - b. Finding: The Action Team finds that several energy efficiency technologies available in the marketplace today are cost-effective beyond the degree to which they are utilized by Floridians, and thus represent emission reduction opportunities available at a net benefit to consumers.
 - c. Finding: The Action Team finds that additional effort in making the public aware of existing energy efficiency and conservation programs offered by utilities is required to increase participation rates and the benefits of such programs for Florida.
 - d. Finding: The Action Team finds that the current regulatory structure for the electric utility sector within Florida may pose disincentives for investments yielding greater energy efficiency and thus reducing utility sales.
 - e. Recommendation: The Action Team recommends further examination of the issue of statewide energy conservation and efficiency targets as a component of the facilitated process recommended for the second phase of the Action Team's work in 2008.
 - f. Recommendation: The Action Team recommends legislative authority for the Public Service Commission to develop programs which provide utilities with financial incentives to make investments in residential and commercial solar hot water systems and other renewable and energy efficiency technologies.
 - g. Recommendation: To build upon the 15 percent increase in energy performance of new construction by 2009 as directed by Governor Crist in Executive Order 07-127, the Action Team recommends stepwise improvements in building efficiency targets beyond 2009.
 - h. Recommendation: To build upon the 15 percent increase in appliance efficiency standards directed by Governor Crist in Executive Order 07-127, the Action Team recommends expanded legislative authority to incorporate additional residential appliances and commercial appliances not subject to federal preemption.
- 4. Market-based regulatory mechanisms, such as cap and trade programs, for use in efficiently reducing greenhouse gas emissions:**
- a. Finding: The Action Team finds that the use of market-based mechanisms is likely to reduce GHG emissions in Florida with greater flexibility and with less net cost than would be the case with traditional regulatory emissions caps alone.

- b. Finding: The Action Team finds that the two principal options (cap and trade, carbon fees, or combinations thereof) each have specific positive and negative considerations, and that each tool has specific applications for which it is best suited.
- c. Finding: The Action Team finds that, given the diversity of sources for GHG emissions, the use of one or more market-based mechanisms to address specific sectors may be warranted over time.
- d. Recommendation: The Action Team recommends that Florida pursue a market-based policy of "cap and trade" by creating tradable emissions allowances as the preferable means meeting the utility sector emissions cap and the statewide emission reduction targets directed by Governor Crist in Executive Order 07-127.
- e. Recommendation: The Action Team recommends a market design process for Florida's tradable allowances market as a vital component of the Florida's Energy and Climate Change Action Plan development process to occur in 2008. This design process should result in final recommendations for several considerations, including but not limited to:
 - an allowance allocation process,
 - economic and emergency safety valves,
 - the creation and use of emission offset credits,
 - a "leakage" strategy regarding the migration of emissions into surrounding states,
 - trial periods, and
 - timeframes for full implementation.

The design process should consider linking a Florida-based allowances trading market with other regional or international markets.

5. Strategies to diversify Florida's electric generation fuels to reduce greenhouse gas emissions and protect Florida's consumers from fuel price volatility:

- a. Finding: The Action Team finds that fuel diversity within Florida's portfolio of electric generation fuels must be maintained and further enhanced.
- b. Finding: The Action Team finds that in evaluating the fuels and technologies that should be included in Florida's future portfolio of generation facilities, a life cycle assessment should be considered.
- c. Finding: The Action Team finds that energy technologies with low carbon emissions such as nuclear and renewable energy are beneficial for energy security objectives as well as greenhouse gas emission reduction objectives.
- d. Finding: The Action Team recognizes the experimental nature of carbon capture, sequestration and storage (CCS) but believes there is value in continuing to explore this possible solution to reducing or eliminating the

carbon released from fossil fuel facilities in the event of a technological breakthrough.

- e. Recommendation: The Action Team recommends further examination of all energy technologies with low carbon emissions in addressing the state's goals of reducing greenhouse gases and pursuing energy security to include public outreach and engagement.
- f. Recommendation: The Action Team recommends further examination of the role of nuclear energy in addressing the state's goals of reducing greenhouse gases and pursuing energy security to include public outreach and engagement. This examination should address issues associated with the transport and storage of nuclear waste.
- g. Recommendation: The Action Team recommends that Florida adopt policies and continue funding which accelerates research, new job creation, development and expansion of renewable resource electric production technologies which may include, but not limited to, solar, ocean, biofuels and wind.
- h. Recommendation: The Action Team recommends the creation of a consortium effort among electric utilities, state government, and state universities to investigate and actively seek pilot projects on the feasibility of carbon capture, sequestration and storage within Florida.

6. Policies for emission reporting and registry that measure and document emission reductions:

- a. Finding: The Action Team finds that quality emissions data from across Florida's economy is critical for the effective design and implementation of any future market-based mechanism.
- b. Finding: The Action Team finds that Florida's participation in The Climate Registry – which now numbers 39 of the nation's 50 states, 1 Mexican state, and 2 Canadian provinces with the balance of provinces committed to joining – efficiently incorporates common reporting protocols for companies doing business in multiple states, including Florida, and establishes an equivalent reporting environment for Florida-based businesses that wish to participate.
- c. Finding: The Action Team finds that in advance of a federal greenhouse gas program, it is in Florida's best interest to document emissions of greenhouse gases from as many sources within the state as possible using nationally recognized reporting protocols.
- d. Recommendation: The Action Team recommends mandatory greenhouse gas emission reporting by all electric utilities to The Climate Registry using The Climate Registry's reporting protocols.
- e. Recommendation: The Action Team recommends that the Department of Environmental Protection consider and propose additional industry sectors as appropriate for inclusion in mandatory registry reporting.

7. **Strategies for reducing the greenhouse gas emissions from motor vehicles:**
- a. Finding: The Action Team finds that the transportation sector accounts for 46% of the carbon dioxide greenhouse gas emissions in Florida and that between 2006 and 2050 the daily vehicle miles traveled is forecast to increase by 240% based on current trends.
 - b. Finding: The Action Team finds that strategies for relieving congestion, providing travel alternatives to automobiles, and integrating transportation and land use planning to produce compact and transit-oriented development can reduce the growth rate of vehicle miles traveled.
 - c. Finding: The Action Team finds that reducing the greenhouse gases associated with vehicle miles traveled and congestion includes key strategies such as transportation demand management, providing modal options, pricing strategies, and freight-specific strategies.
 - d. Finding: The Action Team finds that transportation revenues are largely dependent on motor fuel consumption; increases in vehicle fuel efficiency and alternative fuels may reduce transportation revenue. This increase in efficiency may increase vehicle miles traveled.
 - e. Recommendation: The Action Team recommends that greenhouse gas emission reduction strategies be incorporated into state, regional, and local growth management and transportation planning processes.
 - f. Recommendation: The Action Team recommends that Florida establish growth policies that require or provide incentives for developing regional visions that integrate transportation and land use planning to provide for sustainable growth and reduce greenhouse gas emissions.
 - g. Recommendation: The Action Team recommends research on the impact of greenhouse emission reduction strategies on transportation revenue sources and alternative ways to fund transportation that create incentives to drive less.
 - h. Recommendation: The Action Team recommends that state, regional and local governments establish growth policies that:
 - In urban areas promote compact, transit-oriented development;
 - In rural areas balances the needs for economic development; promotion of agriculture, protection of natural resources; and preservation of rural character while avoiding urban sprawl.
 - Promote energy efficient mass and rail transit wherever feasible as well as strategies to ease the movement of freight in more GHG-efficient ways.
 - i. Recommendation: The Action Team recommends that policies be developed which promote the use of low carbon vehicles.

8. Strategies for increasing the amount of renewable transportation fuels and for reducing the carbon content of fuels, such as a low carbon fuel standard:

- a. Finding: The Action Team finds that the market for renewable biofuels in Florida requires performance-based policy and standards to stimulate investments to accelerate production and market-driven, state-wide distribution.
- b. Finding: The Action Team finds that there is a need to conduct life cycle assessment of transportation fuels and analyses of resources required for sustainability.
- c. Finding: The Action Team finds that other potential renewable transportation fuels require continued research and development prior to commercialization.
- d. Finding: The Action Team finds that a self-sustaining renewable fuels industry using feedstocks derived from Florida biomass can improve energy diversity and security, increase farm income, and create new jobs in Florida.
- e. Recommendation: The Action Team recommends continued funding for research, development, and technology demonstration for a full range of renewable transportation fuels.
- f. Recommendation: The Action Team recommends continued support for existing tax incentives in Florida Statute for alternative transportation fueling infrastructure development in Florida.
- g. Recommendation: The Action Team recommends the development of life cycle analyses of transportation fuels and the use of those analyses to determine appropriate pathways to protect natural resources required for sustainability.
- h. Recommendation: The Action Team will continue to evaluate the option of a low carbon fuel standard including exploring opportunities for a regional standard with other southern states.

9. Policies not addressed in Executive Order 07-126 to reduce greenhouse gas emissions from state and local governments:

- a. Finding: The Action Team finds that an integrated approach to energy and environmental solutions is appropriate at all levels of government.
- b. Finding: The Action Team finds that operating and maintenance expenditures associated with energy equipment and with energy consumed in buildings represent a significant cost over the life of a building.
- c. Finding: The Action Team finds that investment in energy conservation measures in facilities can reduce the amount of energy consumed and produce immediate and long term savings.

- d. Finding: The Action Team finds that energy conserved by appropriate building design not only reduces the demand for energy but also reduces costs for building operation.
- e. Finding: The Action Team finds that the efforts of the Florida Green Building Coalition, Inc. through their Government Green Standards program are valuable and encourages municipalities, counties, and schools to participate in the Green City and Green County initiatives or similar applicable standards.
- f. Recommendation: The Action Team recommends that the appropriate actions required by Executive Order 07-126 be extended by statute to all state government operations.
- g. Recommendation: The Action Team recommends specific legislative authority to remove barriers precluding the use of energy performance savings contracts for use in state government facilities.
- h. Recommendation: The Action Team recommends incentives to assist municipalities, counties, and schools in the development of programs that achieve the Green Standards and designation or similar applicable standards, involve cost-efficient solutions, improve quality of life, and strengthen Florida's economy

10. Policies to reward early emission reductions in advance of statewide or national greenhouse gas regulatory programs:

- a. Finding: The Action Team finds that verified emission reductions by sources in Florida in advance of any state, national, or international program are in the State of Florida's best interest.
- b. Finding: Further, the Action Team finds that verified emissions baselines are in the best interest of those companies with a reasonable expectation of future greenhouse gas regulation.
- c. Recommendation: The Action Team recommends that an early reductions incentive policy be incorporated in the market design process recommended for the second phase of the Action Team's work in 2008.

11. Other policies for efficiently reducing emissions in Florida in conjunction with, or independent of, regional, national, or international agreements:

- a. Finding: The Action Team finds that the emerging global carbon market may present Florida with cost effective opportunities to reduce emissions of greenhouse gases.
- b. Finding: Further, the Action Team finds that linkages with other markets create economic development opportunities and external sources of capital to fund greenhouse gas offset projects located in Florida.
- c. Recommendation: In order to enable the sale of carbon credits from emission offset projects developed in Florida, the Action Team recommends that Florida pursue emission offset monitoring and

verification programs and agreements including but not limited to a Memorandum of Understanding with the Regional Greenhouse Gas Initiative (RGGI).

- d. Recommendation: The Action Team recommends further exploration of linkages to other emerging markets domestically and abroad as a feature of the market design process recommended for the second phase of the Action Team's work in 2008.

APPENDIX C: SUMMARY OF ACTION TEAM MEETINGS

In preparing the findings and recommendations transmitted by this document, the Action Team convened on four occasions in 2007. These very brief summaries are meant to provide procedural context for readers of this document unfamiliar with the Action Team process. These summaries are not intended to replace meeting minutes which have been archived to the Action Team's internet website at:

www.dep.state.fl.us/climatechange/team/default.htm

Meeting 1 – August 29, 2007

In its first meeting, the Action Team established the organizational and procedural means by which it would accomplish its charge under Executive Order 07-128. The Action Team was briefed on State of Florida ethics laws, Governor Crist's Code of Ethics, and Government in the Sunshine standards. The Action Team received briefings from staff on the Governor's actions under Executive Orders 07-126 and 07-127 as well as Florida's initial greenhouse gas inventory. The Action Team then heard presentations from a University of Florida economist regarding market-based regulatory mechanisms, an overview of various approaches to GHG emission reduction from the Pew Center on Global Climate Change, and an overview of carbon "offsets" in regulated markets by the Climate Trust. Following instruction to staff, the Action Team adjourned.

Meeting 2 – September 19, 2007

The Action Team heard presentations from officials from the United Kingdom Department of Environment, Food, and Rural Affairs and the Connecticut Department of Environmental Protection regarding carbon market design consideration. The Action Team then heard a presentation on energy efficiency and conservation opportunities within Florida's building stock. Following public comment and instruction to staff, the Action Team adjourned for the day.

Meeting 3 – October 5, 2007

The Action Team hosted a visit from Governor Crist and heard presentations by Progress Energy Florida, Florida Power & Light, and the Florida Municipal Power Association. The Action Team began deliberating on proposed findings and recommendations presented by staff. The Action Team then heard presentations from staff regarding GHG emissions and energy consumption by the transportation sector and the nexus between land use planning, transportation system planning and investment, and future energy use projections. The Action Team received public comment and briefly returned to deliberations on the proposed findings and recommendations before adjourning for the day.

Meeting 4 – October 29 & 30, 2007

On the first day of the final two day meeting of Phase 1, the Action Team heard presentations from staff regarding alternative fuels, energy grants, an overview of energy programs in state government, and the current implementation of Executive Order 07-126. The Action Team also heard from Commissioner Charles Bronson, Florida Department of Agriculture and Consumer Affairs, on actions and programs the agency is involved with in this area. The Action Team was given an overview of the research occurring within our state university system, as well as presentations on the Florida Energy Commission and the actions being done at the local government level to reduce greenhouse gas emissions. The Action Team received public comment before holding an open discussion on the final report. The Action Team approved the report, with the exception of the findings and recommendations. On day two of the meeting, the Action Team received public comment on the draft findings and recommendations, held deliberations, and then voted the modified findings and recommendations into the report before adjourning for the day.

APPENDIX D: ACKNOWLEDGEMENTS

The work of the Governor's Action Team on Energy and Climate Change was accomplished only through the willingness of many to lend time and expertise. The Action Team wishes to acknowledge those contributions and to express gratitude to all who have helped this process along.

The Action Team applauds the leadership of Governor Charlie Crist on the issues of energy and global climate change and is grateful to Chris Kise for his contributions at Action Team meetings as counselor to the Governor. Presentations from Pat Gleason and Gladys Perez from the Executive Office of the Governor, and Virlindia Doss from the Florida Ethics Commissions, provided helpful guidance in ensuring that the Action Team proceeded in accordance with Florida's open government and ethics laws.

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APPENDIX E: FLORIDA'S ENERGY PROGRAMS

Florida Public Service Commission

The Florida Public Service Commission is charged with assuring that Florida's consumers receive some of their most essential services — electric, natural gas, telephone, water, and wastewater — in a safe, affordable, and reliable manner. In doing so, the PSC exercises regulatory authority over utilities in one or more of three key areas: rate base/economic regulation; competitive market oversight; and monitoring of safety, reliability, and service. Pursuant to Chapters 350, 361, 366 and 368, Florida Statutes, the Commission (which is composed of five Commissioners each appointed by the Governor) and its staff regulates various aspects of public utility operations.

Florida Energy Commission

Created by the Florida Legislature during the 2006 session, the Commission is responsible for developing recommendations for legislation to establish a state energy policy by the Legislature. The recommendations of the commission are based on the guiding principles of reliability, efficiency, affordability, and diversity. The commission is responsible for continually reviewing state energy policy and recommending to the Legislature any additional necessary changes or improvements via an annual report. The Commission operates under specific authority granted in section 377.901, F.S. The Commission is composed of nine members as appointed by the Speaker of the House and the President of the Senate.

Utility Siting Board

The Governor and Cabinet sit as the Utility Siting Board pursuant to Chapter 403, F.S. The Utility Siting Board provides the final deliberation on whether to grant siting certifications for power plants, electric transmission facilities, and natural gas transmission pipelines. The DEP serves as staff to the Governor and Cabinet when sitting as the Utility Siting Board.

Department of Agriculture and Consumer Services

The Department of Agriculture and Consumer Services plays a key role in Florida's energy policy through its charter to protect consumers and market agricultural products for the benefit of Florida's economy.

Farm to Fuel Program

Pursuant to 570.954, F.S., the Department administers the Farm to Fuel Initiative to enhance the market for and promote the production and distribution of renewable energy from Florida-grown crops, agricultural wastes and residues, and other biomass and to enhance to value of agriculture products or expand agribusiness for Florida.

Bureau of Petroleum Inspection

Pursuant to Chapters 501, 525 and 526, F.S., the Department regulates the quality and measurement of petroleum products sold in Florida. Specific activities include field sampling and laboratory testing of gasoline, gasohol, diesel fuel, fuel oil, kerosene, antifreeze and brake fluid. Activities also include routine inspections of retail service station pumps and other commercial petroleum measures for accuracy and correctness and the investigation of citizen complaints on matters within the Bureau's regulatory authority.

Department of Community Affairs

The Department of Community Affairs is the principal clearinghouse for community concerns within Florida including growth management and the administration of state and federal grant funds allocated for use at the community level.

Energy Efficiency Code for Building Construction (Florida Building Commission)

The Florida Building Commissions establishes, updates and maintains the Energy Efficiency Code for Building Construction, a state minimum energy conservation code. The energy code is updated biennially to incorporate evolving technology and provides training and technical assistance for the building industry, local code officials, and consumers.

Appliance Efficiency Standards – Division of Housing and Community Development

Pursuant to section 553.957, F.S., the Department regulates the minimum energy efficiency of certain consumer appliances sold within the State of Florida. Appliances governed under this authority include refrigerators, freezers, and lighting.

Weatherization Assistance Program – Division of Housing and Community Development

The Weatherization Assistance Program annually provides grant funds to community action agencies, local governments, Indian tribes and non-profit agencies to provide specific program services for low-income families of Florida. These entities provide program services throughout the state. Funding for the grant program originates from the U.S. Department of Energy with supplemental funding from the U.S. Department of Health and Human Services.

Low Income Home Energy Assistance Program – Division of Housing and Community Development

The Low Income Home Energy Assistance Program provides grant to local governments and non-profit agencies to assist eligible low-income households in meeting the costs of home heating and cooling. Grants administered under this program are provided by the federal government.

Department of Environmental Protection

The DEP administers Florida's environmental regulatory programs with respect to energy production, transportation, and use across the economy. Instances of the environmental and energy interface include: resource permitting for pipelines, air pollution control permitting for power plants, and permitting for oil drilling. With the transfer of the Florida Energy Office to DEP in 2003, the department has assumed additional duties with respect to Florida's energy policy including analytical support for the policy development process, the promotion of renewable energy via grants and rebates, and the provision of technical assistance to the public.

Florida Energy Office

Pursuant to Chapter 377, F.S., the Florida Energy Office (FEO) provides public information and administers state and federal grant funding for advanced clean energy sources, energy conservation, and energy efficiency. During hurricane season and other natural disasters, FEO coordinates electricity recovery, fuel supply, and fuel requests by local governments, law enforcement, and healthcare facilities throughout the state.

Siting Coordination Office

The Siting Coordination Office (SCO), in conjunction with the DEP Office of General Counsel, is the part of the DEP which has been assigned the tasks for coordinating the interagency review and certification (licensing) under three "Siting Acts."

Electrical Power Plant Siting Act: The Power Plant Siting Act (PPSA), ss. 403.501-.518, F.S., is the State's process for the licensing of large power plants. The PPSA was designed to provide a streamlined process for the development of energy infrastructure, which is necessary for the health, welfare, and protection of the citizens of the state, while protecting the public and the environment from the impacts of the infrastructure. While most facilities need to get any number of permits or approvals from local and state agencies, large power plants in the State are treated differently. All local and state permits or approvals are pre-empted, and only one license is issued, called a "certification". However, all of the local governments or state agencies within whose jurisdiction the power

plant is to be certified participate in the process, to ensure that the issues normally subject to regulatory approval or other authorizations are addressed.

Transmission Line Siting Act: The Transmission Line Siting Act (TLSA), ss. 403.52-.5365, F.S., provides for certification of electrical transmission lines which are 230 kV or larger and which cross a county line and are 15 miles or more in length. However, if a line is to be constructed entirely within certain rights-of-way, the act does not apply. If an applicant so desires, it can request that a line which is less than 15 miles in length or which is within one county be allowed to use the Act.

Natural Gas Transmission Pipeline Siting Act: The Natural Gas Transmission Pipeline Siting Act (NGPSA), ss. 403.9401-.9425, F.S., applies to the construction and operation of intrastate (within Florida) natural gas pipelines. For interstate pipelines, the company would deal with the Federal Energy Regulatory Commission on an EIS and coordination of federal regulatory issues, plus the department for state-level regulatory matters such as wetlands crossings, discharge of hydrostatic test waters, etc; other state and local agencies may also be involved from a regulatory standpoint. Additional thresholds to determine whether an intrastate pipeline line must be licensed under the NGPSA include whether (a) it crosses a county line and is 15 miles or more in length; (b) it is owned and operated by a local distribution company; (c) it is being licensed as an associated facility under the Power Plant Siting Act. However, an applicant can request that a project under these thresholds be allowed to use the Act.

Bureau of Geology

Pursuant to Chapter 377, F.S., the Department's Oil and Gas Section is the permitting authority within the Florida Geological Survey. Companies interested in exploration or production of hydrocarbons in Florida are regulated by the Oil and Gas Section. Primary responsibilities of the Section include conservation of oil and gas resources, correlative rights protection, maintenance of health and human safety, and environmental protection. These concerns are addressed through a system of permits and field inspections to insure compliance.

Waste Reduction Office

The Florida Green Lodging Program is a voluntary, non-regulatory effort administered by the Waste Reduction Office to encourage the lodging industry to conserve and protect Florida's natural resources. The Florida Green Lodging Program acknowledges and promotes lodging facilities that demonstrate water and energy conservation, waste minimization, recycling, indoor air quality, environmentally friendly purchasing, program sustainability, and pollution prevention.

University of Central Florida

- Florida Solar Energy Center - (FSEC) The University of Central Florida's Florida Solar Energy Center is the renewable energy and energy efficiency research institute of the State of Florida. FSEC was created by the Florida Legislature in 1975 as the state's "solar energy" center and has grown substantially into many additional R&D areas including, Photovoltaics, Energy Efficiency, Hydrogen, Alternative Fuels, Fuel Cells, High-Performance Buildings, Solar Thermal Systems, Testing & Certification, and Education and Training. FSEC has a team of 140 researchers, scientists, engineers, architects and technicians. FSEC receives more than 75% of its funding through peer-reviewed federal research contracts and leads the nation in the areas of buildings research, applied photovoltaics, solar thermal systems, hydrogen, and fuel cell R&D.

- Center for Energy and Sustainability – CES is a unit within the UCF Physical Plant designed to further the University's efforts of promoting a community with all members taking active roles in energy conservation and sustainability. CES promotes wise energy use and a productive and comfortable work environment.

Florida State University

- Center for Advanced Power Systems – (CAPS) was created by The Florida State University and the FAMU-FSU College of Engineering in cooperation with the National High Magnetic Field Laboratory to focus on advanced power technologies with particular emphasis on transportation systems, as well as traditional utility systems. The center is developing an academic-industrial consortium focused on the application of recent advances in power semiconductors, materials, advanced controls, and superconductivity to advanced power system technologies.

University of Florida

- Florida Center for Renewable Chemicals and Fuels – (CRCF) was established in January 2002 to facilitate research and graduate education throughout the State University System in the multi-disciplinary areas of renewable chemicals and fuels. The Center solves new technological challenges, serves as a forum to foster productive interactions among faculty and students, assists faculty in the development of competitive research grants, and increases the visibility of this important activity at the state and national levels.

- Program for Resource Efficient Communities – (PREC) integrates and applies the University of Florida's educational and analytical assets to promote the adoption of best design, construction, and management practices that measurably reduce energy and water consumption and environmental degradation in new residential community developments.

- Florida Institute for Sustainable Energy – (FISE) brings together the broad research capabilities of the University of Florida to address societal needs for a sustainable energy future. This includes energy efficiency, renewable energy generation, nuclear energy, energy policy/economics, and energy education/outreach. There are 22 energy related centers and laboratories at UF as well as the only Nuclear Engineering Department in the State. The Institute's structure covers numerous units within the Colleges of Engineering, Business, Law, Building Construction, Liberal Arts and Sciences, SNRE, IFAS, and the UF Office of Sustainability, and provides the necessary umbrella organization to promote interdisciplinary research and education. Its facilities include a recently awarded Florida Center of Excellence, the *FISE Energy Technology Incubator*, to accelerate commercialization of energy technologies.
- Institute of Food and Agricultural Sciences – (IFAS) is a federal-state-county partnership dedicated to developing knowledge in agriculture, human and natural resources, and the life sciences, and enhancing and sustaining the quality of human life by making that information accessible. IFAS is the research and development center for Florida's agricultural and natural resources industries that have a \$97.8 billion annual impact.
- Industrial Assessment Center – (IAC) funded by the US Department of Energy as part of a national program to perform no-cost energy audits for small to medium sized industries, the IAC program has established a record of quality performance that has cost-effectively improved the energy efficiency of more than 3000 manufacturing plants. The operational goal of the IAC is to provide both on-site energy services and follow-up services in a timely and thorough manner that reflects the overall IAC record for quality and cost-effectiveness.
- Powell Center for Construction and Environment – (PCCE) is primarily a research organization dedicated to the resolution of environmental problems associated with planning and architecture and the determination of optimum materials and methods for use in minimizing environmental damage. The Center develops sustainable building codes for residential construction, conducts seminars, symposia, professional conferences, and courses on the subject of sustainable development and construction related environmental regulations, activities, and research.
- Public Utility Research Center - (PURC) provides international training and strategic research in public utility regulation, market rules, and infrastructure management in the energy, telecommunications, and water industries. Its outreach activities support the expanded deployment and efficient delivery of telecommunications, energy and water/wastewater services, including the achievement of environmental objectives. To date, 1,810 participants from more

than 130 nations have participated in the PURC/World Bank International Training Program in Utility Regulation and Strategy. In addition, PURC researchers have published numerous articles on incentive regulation, utility pricing, benchmarking, investor perspectives, and market reform; these studies form the foundation of training materials.

University of South Florida

- Clean Energy Research Center – (CERC) – serves to organize scientific research, technical development, infrastructure development, and information transfer in collaboration with energy producers and the transportation sector to support economic development of manufacturing and high technology businesses.

University of North Florida

- IEA Clean & Renewable Energy Lab – (CREL) explores alternative energy sources including solar energy, fuel cell technology, and alternative fuels such as hydrogen and methanol. The lab also conducts exhaust and emission testing with alternative fuels.

Florida International University

- Applied Research Center – (ARC) is an applied research and technology development center designed to develop next-generation, integrated solutions to environmental, energy, and information challenges delivering the quality and value of a top-ranked research university to clients in government.

Florida Atlantic University

- Center for Excellence in Ocean Energy Technology – (CEOET) Center of Excellence in Ocean Energy Technology is a synergistic partnership among academia, industry and government laboratories combining expertise in ocean engineering and science, fabrication and testing, utilizing the South Florida Testing Facility range to foster the research, design, development, implementation, testing, and commercialization of cutting-edge ocean energy technologies that are cost-competitive with existing fossil-fuel-based power generation. Ocean current, thermal, wave, and tidal-based energy are focus areas for development as renewable power sources.

Technological Research and Development Authority

The Technological Research and Development Authority (TRDA) was established by the Florida Legislature in 1987 as an Independent Special District of the state. It is served by a five-member board of directors appointed by the Governor of Florida. As an Independent Special District the TRDA leverages funding from federal, state and private resources to develop and implement technology-based programs across four target areas: education, business, incubation, energy and technology transfer. By infusing new

technology into Florida businesses and schools, the TRDA helps to strengthen the economy and education throughout the state and nation.

APPENDIX F: KEY TERMS

Biodiesel - An oxygenated fuel, primarily alkyl esters, produced from a range of biomass-derived feedstocks including oilseeds, waste vegetable oils, cooking oil, animal fats and trap grease, which can be used in blends or in "neat" form in compression-ignition engines to reduce emissions and improve engine performance.

Biomass – biological matter that can be used as a source of energy including wood and other plant matter, municipal wastes and methane produced from landfills and food crops and other grain surpluses.

Cap and Trade – A market-based system of limiting emissions in which a limited number of emissions permits are issued in the aggregate (cap); these permits are then freely exchangeable in markets (trade).

Carbon Dioxide (CO₂) – A colorless, odorless, non-poisonous gas that is a normal part of Earth's atmosphere. Carbon dioxide is a product of fossil-fuel combustion as well as other processes. It is considered a greenhouse gas as it traps heat (infrared energy) radiated by the Earth into the atmosphere and thereby contributes to the potential for global warming.

Climate change – Changes in climate that depart from normal variability, representing significant changes in averages and/or extremes.

Climate change impacts – Effects of climate changes such as temperature change, precipitation change, severe weather events and sea level rise on life systems.

Combined cycle – An electric power generating method in which combustible gases are burned in a combustion turbine and high-temperature gases from that operation are used to raise steam that is passed through a steam turbine. Both cycles drive electric generators.

Cooperatives – A cooperatively owned electric utility (co-op) is a joint venture organized for the purpose of supplying electric energy to a specified area. Cooperatively-owned utilities are non-profits and any excess revenues will be refunded back to the members. Such ventures are generally exempt from the federal income tax laws. Most cooperatives have been financed by the Rural Electrification Association. There are 18 cooperatively-owned utilities within Florida and three of them own their generation facilities.

DACS – Florida Department of Agriculture and Consumer Services

DCA – Florida Department of Community Affairs

Demand – The rate at which electric energy is delivered to or by a system or part of a system, generally expressed in kilowatts or megawatts, at a given instant or averaged over any designated interval of time. Demand should not be confused with load.

Demand-side management (DSM) – The planning, implementation, and monitoring of utility activities designed to encourage consumers to modify patterns of electricity usage. Demand-Side management includes a broad range of load-shape objectives, including strategic conservation and load management, as well as strategic load growth

DEP – Florida Department of Environmental Protection

DMS – Florida Department of Management Services

DOT – Florida Department of Transportation

DSM – Demand Side Management – The planning, implementation, and monitoring of utility activities designed to encourage consumers to modify patterns of electricity usage. Demand-Side management includes a broad range of load-shape objectives, including strategic conservation and load management, as well as strategic load growth.

Electric Utility - as defined by the Florida Statutes 366.02(2) means any municipal electric utility, investor-owned electric utility, or rural electric cooperative which owns, maintains, or operates an electric generation, transmission, or distribution system within the state.

Energy infrastructure – The capital equipment used to supply energy; e.g., power plants, refineries, natural gas pipelines, electric power lines and substations.

Energy Security - includes having an adequate supply of fuel for (1) electric generators from sources that are secure from civil unrest and inclement weather, (2) the transportation sector, and (3) securing the transmission and distribution system that delivers electricity.

Ethanol – An alcohol fuel produced chemically from ethylene or biologically from the fermentation of various sugars from carbohydrates found in agricultural crops and cellulosic residues from crops or wood. Ethanol is often made from plants such as corn and is typically blended in various proportions with conventional gasoline to make transportation fuel.

Florida Energy, Efficiency and Conservation Act (FEECA) – An act adopted by Florida to require electric and gas utilities to offer efficiency programs to customers to assist utilities in reducing the demand for energy.

Fossil fuels – Hydrocarbon fuels derived from fossils: specifically coal, petroleum, and natural gas.

Greenhouse Gas (GHG) – A collective term for gases, such as carbon dioxide, that trap heat in the atmosphere and contribute to climate change.

Gigawatt (GW) – A unit of power equal to 1,000 megawatts or one billion watts.

Investor-Owned Electric Utility (IOU) - An electric utility organized as a taxpaying business usually financed by the sale of securities in the free market. Investor-owned properties are managed by representatives regularly elected by their shareholders. They are regulated by the Florida Public Service Commission. There are five investor-owned electric utilities within Florida:

- Florida Power & Light Company (47 percent of state's generating capacity)
- Gulf Power Company (five percent of state's generating capacity)
- Progress Energy Florida (21percent of state's generating capacity)
- Tampa Electric Company (nine percent of state's generating capacity)
- Florida Public Utilities Company (Non-Generating utility)

Four out of the five investor-owned utilities own their generation facilities.

Intergovernmental Panel on Climate Change (IPCC) – The United Nations' Intergovernmental Panel on Climate Change was established in 1988 by the World Meteorological Organization and the United Nations Environmental Program to assess the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation.

Kilowatt hour (kWh) - A measure of electricity delivered or consumed.

Life Cycle Assessment (LCA) – The assessment of the environmental impact of one or more products or services throughout its lifespan. In the context of the energy industry, an LCA is a quantitative evaluation that includes all tangible and some intangible costs of energy production from the initial project conception to the final step of returning the land to its original or next use state.

Load – an end use device or customer that receives power from the electric system. Load should not be confused with demand, which is the measure of power that a load receives or requires.

Megawatt (MW) – A unit of power equal to 1,000 kilowatts or 1,000,000 watts.

Mitigation – Actions that respond to concerns about climate change by reducing greenhouse gas emissions.

Municipally-Owned Electric Utility - An electric utility system owned and/or operated by a municipality engaged in serving residential, commercial and/or industrial customers, usually within the boundaries of the municipality. There are 35 municipally-owned utilities within Florida and 22 of them own generation facilities. These utilities' rates and charges are set by their municipality and any revenues collected over cost are used by the municipality to support local services.

Peaking load units – Electricity supply units designed to respond to demands, often short-lived, that are significantly above normal base loads.

Portfolio standards – Guidelines or requirements that total electricity supply include one or more set minimums for particular sources, such as renewable energy.

Power plants – Facilities that produce electricity.

PSC – Florida Public Service Commission

Reliability – The degree of performance of the elements of the bulk electric system that results in electricity being delivered to customers within accepted standards and in the amount desired. Reliability may be measured by the frequency, duration, and magnitude of adverse effects on the electric supply. Electric system reliability can be addressed by considering two basic and functional aspects of the electric system – adequacy and security.

Renewables - Renewable energy as defined by Florida Statutes 366.91(2)(b) means electrical energy produced from a method that uses one or more of the following fuels or energy sources : hydrogen produced from other than fossil fuels, biomass, solar energy, geothermal energy, wind energy, ocean energy, and hydroelectric power. The term includes the alternative energy resource, waste heat, from sulfuric acid manufacturing operations.

Renewable energy – Energy based on resources that are naturally renewed over time periods equivalent to resource withdrawals.

Stakeholders – Individuals, groups, and/or institutions with an interest in the outcome of a decision-making process.

TRDA - Technological Research and Development Authority

USEPA – United States Environmental Protection Agency

VMT – Vehicle Miles Traveled