



# Governor’s Action Team on Energy and Climate Change

## State of Florida

### Catalog of State Actions

#### Agriculture, Forestry, and Waste Management Technical Work Group

A catalog of state-level, GHG-reducing actions and policy options based on actions undertaken or considered by state, local and private actors.

#### Key to Future Rankings of Options in the Following Tables

Potential GHG Emission Reductions*	Potential Cost or Cost Savings* <sup>†</sup>
<b>High (H):</b> At least 1.0 million metric tons of carbon dioxide equivalents (MMtCO <sub>2</sub> e) per year by 2020	<b>High (H):</b> \$50 per tCO <sub>2</sub> e or above
<b>Medium (M):</b> From 0.1 to 1.0 MMtCO <sub>2</sub> e per year by 2020	<b>Medium (M):</b> \$15–\$50/tCO <sub>2</sub> e
<b>Low (L):</b> Less than 0.1 MMtCO <sub>2</sub> e per year by 2020, or 1 MMtCO <sub>2</sub> e by 2050	<b>Low (L):</b> Less than \$15/tCO <sub>2</sub> e
<b>Uncertain (U):</b> Not able to estimate at this time	<b>Negative (Neg):</b> Net cost savings
	<b>Uncertain (U):</b> Not able to estimate at this time

\* Several measures may overlap in terms of emissions reductions and/or cost impacts. Estimates assume measures would be implemented independently from other measures.

<sup>†</sup> Costs are denoted by a positive number. Cost savings (i.e., “negative costs”) are denoted by a negative number.

#### Definition of “Priorities for Analysis”:

**High:** High priority options will be analyzed first.

**Medium:** Medium priority options will be analyzed next, time and resources permitting.

**Low:** Low priority options will be analyzed last, time and resources permitting.

#### Notation of Options:

**Options marked in bold and asterisk (\*)** indicate some of the related state actions that are approved or underway, as described further in the companion options description document. Technical Work Group (TWG) members are encouraged to provide information on other relevant actions.

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Energy Security, Externalities & Feasibility Considerations	Priority for Analysis	Notes / Related Actions in Florida
<b>AFW-1</b>	<b>AGRICULTURE—PRODUCTION OF ENERGY AND MATERIALS</b>					
1.1	Expanded Utilization of Biomass Feedstocks for Electricity, Heat, or Steam Production			Consider potential invasiveness of species when evaluating use of feedstocks.  Related to 6.1 and 9.1.		EO 07-127 includes a request to establish a Renewable Portfolio Standard that would require utilities to obtain 20% of generation from renewable sources—may include biomass feedstocks.
1.2	In-State Liquid/Gaseous Biofuels Production			In addition to ag residues or purpose-grown crops could include algal oil production.		Current efforts include: Sales tax exemption for fueling equipment <ul style="list-style-type: none"> <li>• Corporate income tax credit for production and fueling equipment</li> <li>• DACS Florida Farm to Fuel program</li> <li>• FDEP Renewable Energy Technologies Grant Program</li> <li>• Funding to UF IFAS for cellulosic ethanol.</li> </ul> New cellulosic ethanol pilot plant being built in FL.
1.3	Manure Digesters/Other Waste Energy Utilization					EO-07-127 RPS request for renewable sources
1.4	Improving Energy Capture from Biomass Heat					

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1.5	Expand Production/Use of Bio-based Materials and Chemicals					Can include use of purpose grown crops as well as ag residues as feedstocks.
1.6	Improved Commercialization of Biomass Conversion Technologies					
<b>AFW-2</b>	<b>AGRICULTURE—LIVESTOCK</b>					
2.1	Manure Management & Utilization			See sub-elements in the Option Descriptions Document.		Florida law authorizes the development of best management practices for manure management & utilization
2.2	Changes in Animal Feed					
2.3	Technology Improvements to Increase Water Conservation					
<b>AFW-3</b>	<b>AGRICULTURE—CROP PRODUCTION</b>					
3.1	Soil Carbon Management					Refer to the paper by Sabine Grunwald called "Role of Florida soils in carbon sequestration"

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3.2	Nutrient Management			Can include commercial nutrients, manure, and wastewater biosolids application.		IFAS, DEP & DACS have developed Best Management Practices for row crops in Florida; includes irrigation, fertilization, and pest management practices
3.3	Technology Improvements to Increase Efficiency			Efficiencies cover full crop production cycle (tilling, planting, cultivation, harvest)		See 3.2
3.4	Water Management					DEP has a non-point source management program for agriculture IFAS, DEP & DACS have identified the best way to manage for better crop production
3.5	Drainage Management					Permitting requirements currently do not allow for standing water.
<b>AFW-4</b>	<b>AGRICULTURE—LAND USE CHANGE</b>					
4.1	Land Use Management that Promotes Permanent Cover			Concern with taking land out of production.		IFAS, DEP & DACS have developed BMPs related to water quality protection associated with various agricultural concerns.

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4.2	Preserve Open Space/Agricultural Land					See Option Descriptions document for current programs on land acquisition/conservation easements.
<b>AFW-5</b>	<b>AGRICULTURE—FARMING PRACTICES</b>					
5.1	Increase On-Farm Energy Production and Efficiency					
5.2	Promotion of Farming Practices that Achieve GHG Benefits					Required by Florida Statute 570.954, which promotes the farm to fuel initiatives. This promotes the use of Florida crops and agricultural wastes as a source of renewable energy
5.3	Improved Harvesting Methods to Achieve GHG Benefits					Can include options to address agricultural residue burning in addition to other measures (e.g. efficiency). Covers crop and livestock sectors.
5.4	Programs to Support Local Farming/Buy Local					Florida Agricultural Promotional Campaign (FAPC) promotes local farming and agricultural products in Florida

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5.5	Promotion of Urban Agriculture, Community Gardens, and Green Roofs					
<b>AFW-6</b>	<b>FORESTRY—PRODUCTION OF ENERGY AND MATERIALS</b>					
6.1	Expanded Use of Forest Biomass Feedstocks for Electricity, Heat and Steam Production					Florida Division of Forestry promotes the development of woody biomass. See also 1.1 above
6.2	In-state Liquid/Gaseous Biofuels Production					See 1.2 above
6.3	Improved Energy Capture from Wood Waste Combustion					
6.4	Improved Commercialization of Biomass Conversion Technologies					
6.5	Expanded Use of New, Used, & Recycled Wood Products for Building Materials					
<b>AFW-7</b>	<b>FORESTRY—BIOMASS PROTECTION AND MANAGEMENT</b>					

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7.1	Forest Protection— Reduced Clearing And Conversion to Non-forest Cover					Florida has aggressively pursued the acquisition of conservation lands over the past 25 years preserving more than 2M acres with the Preservation 2000 and Florida Forever programs. Recent 16,000 forest project in Dixie County.
7.2	Urban Forestry					The Urban & Community Forestry Program in DACS works in promoting urban forestry and provides grants.
7.3	Afforestation and/or Restoration of Non-forested Lands					
7.4	Forest Management for Carbon Sequestration					Includes silvicultural practices in addition to state and private forests. Silviculture BMPs developed by DACS, DEP, and IFAS related to water quality protection and water conservation

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7.5	Mitigation of Forest Carbon Sequestration Loss and Emissions Due to Wildfire					Florida's wildlands fire prevention program is organized by the Division of Forestry in DACS and executed by water management districts, DEP, the Fish & Wildlife Conservation Commission, as well as federal land managers.
7.6	Mitigation of Forest Loss Due to Insects/Disease					All land managing agencies in Florida use prescribed fire and other means in order to prevent insect and/or disease outbreaks.
<b>AFW-8</b>	<b>FORESTRY—WOOD PRODUCTS AND WASTE</b>					
8.1	Improved Mill Waste Recovery					
8.2	Improved Logging Residue Recovery					
<b>AFW-9</b>	<b>WASTE MANAGEMENT—WASTE MANAGEMENT STRATEGIES</b>					

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9.1	Expanded Use of MSW Biomass (Including Yard and Hurricane Waste Biomass) Feedstocks for Electricity, Heat, and Steam Production					Related to 1.1 and 6.1. Note also the relationship to the Energy Supply Sector given the State's waste to energy plants. Existing statutory prohibitions promote separate collection of yard waste biomass.
9.2	In-State Liquid/Gaseous Biofuels Production					Related to 1.2 and 6.2
9.3	Advanced Recycling and Composting			Markets for recovered materials will determine feasibility.		DEP administers a Waste Reduction program which includes recycling grants to local government; a loan program for recycling businesses; & a recycling business assistance center. Florida counties must implement a recycling program with a minimum 30% MSW reduction objective.
9.4	Promotion of Bioreactor Technology (Advanced Municipal Solid Waste Management Practices)					DEP and the UF Hinkley Center for Solid and Hazardous Waste Management currently funding three demonstration projects in Florida. See <a href="http://www.bioreactor.org">www.bioreactor.org</a>

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9.5	Source Reduction Strategies					The Pollution Prevention Program and the waste reduction section are involved with the implementation of waste reduction strategies throughout the state.
9.6	Resource Management Contracting					
9.7	Enhanced Management of Organic Waste					
9.8	Improved Commercialization of Biomass Conversion Technologies					
<b>AFW-10</b>	<b>WASTE MANAGEMENT—LANDFILL GAS STRATEGIES</b>					
10.1	Utilize or Flare Landfill Methane at non-NSPS (smaller) Sites					DEP regulates through permits
10.2	Methane and Biogas Energy Programs					Promoted by the Hinkley Center at UF
10.3	Landfill Methane Energy Programs					Florida is a partner in the EPA's Landfill Methane Outreach Program
<b>AFW-11</b>	<b>WASTE MANAGEMENT—WASTEWATER ACTIVITIES</b>					

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11.1	Wastewater Treatment Plant (WWTP) Biosolids for Energy Production					Note also that WWTP biosolids could be utilized under 3.1 Nutrient Management
11.2	Energy Efficiency Improvements at WWTPs and/or Potable Water Plants					
11.3	Lower Waste Processing Needs (lower water consumption, waste production)					DEP seeks to reduce waste process through various programs (wastewater & waste) and best management practices
11.4	Install Digesters and Turbines or Engines					
11.5	Algae and Bio-Oils					Note: could also be addressed under 1.2.