



Catalog of State Actions Energy Supply Technical Working Group

Draft Prepared for Climate, Energy and Commerce Advisory Committee (CECAC)
Meeting #2 – June 27, 2007

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 Tables that Follow:

Potential GHG Emission Reductions <u>1/</u>	Potential Cost or Cost Savings <u>1/ 2/</u>
High (H): At least 1.0 million metric tons (MMt) carbon dioxide equivalent (CO ₂ e) per year by 2020	High (H): \$50 per metric ton CO ₂ e (tCO ₂ e) or above
Medium (M): From 0.1 to 1.0 MMtCO ₂ e per year by 2020	Medium (M): \$5-50/tCO ₂ e
Low (L): Less than 0.1 MMtCO ₂ e per year by 2020, or 1 MMtCO ₂ e by 2050	Low (L): Less than \$5/tCO ₂ e
Uncertain (U): Not able to estimate at this time	Negative (Neg): Net cost savings
	Uncertain (U): Not able to estimate at this time
<p><u>1/</u> Several measures may overlap in terms of emissions reductions and/or cost impacts. Estimates assume measures would be implemented independently from other measures.</p> <p><u>2/</u> Costs are denoted by a positive number. Cost savings (i.e., “negative costs”) are denoted by a negative number.</p>	

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.

Option No.	GHG Reduction Policy Option	Potential GHG Emissions Reduction	Cost per Ton	Externalities, Feasibility Considerations	Priority for Analysis	Notes / Related Actions in SC
ES-1	EMISSIONS POLICIES AND OVERARCHING ITEMS					
1.1	Regional GHG cap and trade					
1.2	Carbon (GHG) tax					
1.3	Generation performance standards and/or mitigation requirements for electricity					
1.4	Integrated resource planning (IRP)					SC requires the SC Public Service Authority and electric utilities regulated by the Public Service Commission to submit IRPs every three years, with annual updates. An electric cooperative or municipally owned electric utility must submit an IRP to the State Energy Office (EO) if it plans to acquire generation capacity >12 MW; the EO evaluates the environmental and economic consequences of the IRP but does not have regulatory authority related to IRPs.
1.5	Voluntary GHG commitments					

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1.6	Technology Research & Development					<p>Bio-diesel research at Clemson and U.</p> <p>Hydrogen research at Savannah River National Laboratory.</p> <p>SRNL CO₂ monitoring.</p> <p>The National Science Foundation Center for Fuel Cells – USC.</p> <p>Hydrogen production and storage and automotive system integration- International Center for Automotive Research (CU-ICAR).</p> <p>FuelCellSouth - fuel cell researchers, entrepreneurs, and businesses preparing for the emerging hydrogen economy.</p> <p>The Greater Columbia Fuel Cell Challenge -creating a plan to make the region a center for fuel cell use.</p> <p>EngenuitySC - leadership council designed to coordinate technology initiatives in Columbia.</p>
1.7	Technology transfer - bringing					

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	R&D into commercial operation					
1.8	Address plant-wide efficiency					
1.9	Join or start regional climate association					<p>Pewclimate.org references many states being in regional agreements with other states and explains the benefits of such associations. However, Southeastern states have no regional associations related to climate. Can we include an action for SC to be included in or starting or promoting regional activity?</p> <p>Reference page 3 of http://www.pewclimate.org/docUploads/States%20Brief%20Template%20March%202007_jgph.pdf</p>

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ES-2	RENEWABLE ENERGY AND ENERGY EFFICIENCY					
2.1	Renewable Portfolio Standard (RPS)					This may include energy efficiency but not nuclear or CCS with sequestration. The latter are included in 2.13, "Environmental Portfolio Standards".
2.2	Grid-based renewable energy incentives and/or barrier removal					

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2.3	Distributed renewable energy incentives and/or barrier removal (continued, next page)					<p>SC Alternative Energy bills establish tax incentives for residential/business solar heating and cooling systems – tax credit of 25% of installation cost - \$3,500 annual tax credit limit (amounts over the cap can be rolled over to subsequent years)</p> <p>Under consideration:</p> <ul style="list-style-type: none"> • Tax credit for purchase and installation of equipment for creating energy from biomass • Renewable energy revolving grant and loan programs <p>In addition, the Public Service Commission, Santee Cooper and the electric cooperatives are considering net metering.</p>

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2.4	Green power purchases and marketing					Green Power program through Santee Cooper (landfill methane – 5 sites,) expanding into solar, biomass, geothermal, and wind. Eighteen electric co-ops also participate in the green power program through Santee Cooper (e.g., Palmetto Green Power).
2.5	Combined Heat and Power (CHP) standards, incentives and/or barrier removal					
2.6	Pricing strategies to promote renewable energy and/or CHP (e.g. net metering)					
2.7	Renewable energy development issues (zoning, siting, etc.)					Public perception issue with siting ethanol plant in Batesburg-Leesville.

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2.8	Technology-focused initiatives (biomass co-firing, energy storage, fuel cells, etc.)					Bio-diesel research at Clemson and U.
2.9	Decoupling of energy sales and revenues to allow investment in efficiency and renewals to be considered in parity with investment in new conventional capacity					
2.10	SC Biomass Council recommendations					Legislature is currently considering items on generation of power from biomass

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2.10a	Biomass Financing					<p>Includes: GRANTS AND LOANS:</p> <ol style="list-style-type: none"> 1. Small-Scale Alternative Energy Revolving Loan Program 2. Provide critical information (to support biomass energy and products development in South Carolina) 3. Biomass Energy Application and Bioproducts Grant Program <p>PRODUCTION INCENTIVES:</p> <ol style="list-style-type: none"> 4. Biomass energy production incentive <p>PROPERTY, SALES, AND FRANCHISE TAX EXEMPTIONS:</p> <ol style="list-style-type: none"> 5. Energy Conversion Facilities Tax Exemption <p>TAX CREDITS:</p> <ol style="list-style-type: none"> 6. Jobs Creation Tax Credit
2.10b	Biomass – exemption from air regulations					

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2.10c	State Mandates – State Government Renewable Energy Use					
2.10d	Net Metering					
2.10e	Federal Clean Renewable Energy Bonds					
2.10f	Establish funding for the South Carolina Energy Office and the South Carolina Institute for Energy Studies					
2.10g	Joint Energy Policy Working Group					
2.11	Reducing additional requirements put on hydro during relicensing					
2.12	Existing hydro modernization					
2.13	Environmental Portfolio Standard, including renewables, energy efficiency, and nuclear power					
2.14	Regulatory model to equalize utility returns on energy efficiency with returns on traditional power supply					

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2.15	Attract renewable energy technology businesses to South Carolina					We mention technology R&D and discussed feasibility studies, etc. But should we not also propose policy to entice businesses that currently manufacture wind turbines, or tidal turbines, or solar PV, etc. to set up shop in SC? While SC may not propose its own RPS or Cap & Trade, it may happen at the national level. Positioning our state to better address the availability and promotion of renewable energy technologies within our borders would benefit the general population in many ways.
ES-3	FOSSIL FUEL AND NUCLEAR ELECTRICITY					
3.1	Advanced fossil fuel technology (e.g. IGCC, CCSR) incentives, support, or requirements					A supercritical coal plant is planned.

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3.1a	IGCC-specific incentives, support, or requirements					
3.2	New Nuclear Power					<p>SCE&G/Santee Cooper - new nuclear plant planned (two 1000 Megawatt units.)</p> <p>Savannah River National Laboratory, which is partnered with the Economic Development Partnership of Aiken and Edgefield counties, and EnergySolutions will each receive a part of the \$10 million in Global Nuclear Energy Partnership grants to allow for detailed studies of the proposed nuclear waste recycling plants.</p> <p>Savannah River National Lab is applying for the nuclear recycling program.</p> <p>Duke Energy - new nuclear plants at the old Cherokee site. (two 1000 Megawatt units).</p>

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3.3	Relicensing/Uprating Existing Nuclear Power					All operating Nuclear Plants in the state have received 20-year license renewals. H.B. Robinson 1.7% on 11/05/2002
3.4	Efficiency improvements and repowering existing plants					
3.5	Technology-focused initiatives					Tax incentive for fuel cell development.
3.6	Expanded training to provide utility workforce					
ES-4	FUEL PRODUCTION, PROCESSING AND DELIVERY					
4.1	Oil and gas production: GHG emission reduction incentives, support, or requirements					
4.2	Natural gas transmission and distribution					
4.3	Oil Refining: GHG emission reduction incentives, support, or requirements					
4.4	Coal Production: GHG emission reduction incentives, support, or requirements					
4.5	Coal-to-liquids Production:					

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	GHG emission reduction incentives, support, or requirements					
4.6	Low-GHG Hydrogen production incentives and support					
ES-5	CARBON CAPTURE AND STORAGE OR REUSE					
5.1	CCSR incentives, requirements and/or enabling policies (administration, regulation, liability, incentives)					
5.2	R&D for CCSR					
5.3	State study into pumping CO ₂ into Blake Ridge for enhanced gas recovery					
5.4	State study into new technologies for carbon removal					
ES-6	OTHER ENERGY SUPPLY OPTIONS					
6.1	Transmission system upgrading					
6.2	Reduction of transmission and distribution line losses					
6.3	General distributed generation support (interconnection rules, net metering, etc.)					

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6.4	Environmental (GHG emissions) disclosure					
6.5	Landfill Gas Recovery (see also Waste)					SC now has six landfill methane to energy facilities. One provides power directly for manufacturing processes. More are in the pipeline.
6.6	Waste to Energy (see also Waste)					Facilities in Eastover and Charleston. Under consideration- Barnwell and Aiken counties nuclear recycling facilities.

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6.7	N ₂ O reduction co-benefit					<p>Nitrous Oxide, a minor component of total NO_x emissions from fossil fuel combustion, is one of the most powerful GHG's. Each ton of N₂O represents > 250 tons CO₂e. Recent/planned SCR installations at SCE&G-Cope, Wateree and Williams impact NO_x emissions from units totaling ~17,500 mmBtu/Hr. What component of total NO_x reductions comprises N₂O reductions? Will need to conduct further study for better assessment.</p>