

**Energy Supply (ES) Technical Work Group
 Catalog of State Climate Mitigation Options**

Prepared for the ES Technical Working Group (TWG) Call #3, June 1, 2006, 9:00-11:00 AM

Key to Rankings of Options in the Table that Follows:

Potential Emission Reductions <u>1/</u>	Potential Cost or Cost Savings <u>1/ 2/</u>
High (H): At least 1 Million Metric Tons (MMT) carbon dioxide equivalent (CO ₂ e) per year by 2020 (~1% of current NC emissions)	High (H): \$50 per Metric Ton CO ₂ e (MTCO ₂ e) or above
Medium (M): From 0.1 to 1 MMT CO ₂ e per year by 2020	Medium (M): \$5-50/MTCO ₂ e
Low (L): Less than 0.1 MMT CO ₂ e per year by 2020, or 1 MMT CO ₂ e by 2050	Low (L): Less than \$5/MTCO ₂ e
Uncertain (U): Not able to estimate at this time	Uncertain (U): Not able to estimate at this time
<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.	
<u>2/</u> 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 with an asterisk (*) indicate options that are at least partially “base case” policies, i.e., that have been considered or undertaken at some level in North Carolina.

** Options marked with a double asterisk (**) indicate options that are included as recommendations in the September 1, 2005 NC DENR Report under the Clean Smokestacks Act of 2002.

Table 2 - Energy Supply (ES) - DRAFT

Option No.	Climate Mitigation Option	Priority for Analysis	Potential GHG Emissions Reduction	Potential Cost or Cost Savings	Ancillary Impacts, Feasibility Considerations	Notes
ES-1	RENEWABLE ENERGY					
1.1	Environmental Portfolio Standard (renewables and energy efficiency) with renewable energy credit trading**	Tentatively as “H”	H	L-H		Potentially attractive measure; let’s keep this in consideration; need to learn more about ongoing commissioned study
1.2	NC Greenpower renewable resources program *		L	H		In effect since 2003; subscription rate currently quite low; voluntary customer demand-driven measure; effect on statewide GHG reductions appears to be negligible (about 0.1% of overall emissions); cost of measure is high (about \$2/100 kWh). CAPACG: make sure to incorporate all elements of voided 1.3 into 1.2

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1.3	State purchase of electricity through the NC Greenpower renewable resources program**		H	L-H		This measure has been eliminated as it overlaps with measure 1.2
1.4	Public Benefit Charge on electricity bills for funding efficiency activities**		H	H (savings)		Need to also consider tax credits or rebates for buyers of new, low-GHG emitting technologies
1.5	Renewable Energy Incentives (biomass, wind, solar, geothermal)*		Hi	Lo-Hi		CAPAG: address opening up of Ridge law, decrease barriers to wind, subsidies for wind development
1.6	Green Power Purchases and Marketing*		?	?		
1.7	Renewable energy development issues (zoning, siting, etc.)		?	?		
1.8	Research and Development (R&D) for renewable technologies		U	U		
1.9	Landfill Gas Recovery (see also Waste)		U	U		
1.10	Waste to Energy (see also Waste) **		Hi	L-H		
ES-2	DISTRIBUTED GENERATION (DG)					
2.1	Incentives for combined heat and power (CHP) and clean DG**		M-H	L		CAPAG: decrease regulatory barriers for local siting

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2.2	Removing barriers to CHP and clean DG (including utility rate and interconnection barriers, financing, information, etc.)**		M-H	L		
2.3	Interconnection Rules for clean, distributed generation*,**		L	L		
2.4	Net Metering*,**		U	U		
2.5	Pricing strategies		?	?		
2.6	Portfolio Standards for Power Retailers		U	U		Envisioned to focus on distribution company standards
ES-3	ADVANCED FOSSIL FUEL					
3.1	Incentives for advanced coal, including IGCC and carbon capture and storage (CCS)		H	M/H		Need to consider advanced pulverized coal technologies (input from 11 April meeting). Also need to consider Production subsidies or tax credits to firms bringing new technologies to market
3.2	Incentives for CO2 pipelines for CCS		H	H		
3.3	Fuel Cell Development Incentives		U	U		

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3.4	Combined H2/electricity production from fossil fuels with sequestration		Hi	H		
3.5	Research and Development (R&D)		U	U		Direct Government funding of R&D, though perhaps more appropriate at federal level, could affect NC through R&D contracts with private firms, R&D grants and contracts with NC universities, Intramural R&D conducted at government labs, R&D contracts with consortia (2 or more of the above), and R&D tax credits
3.6	Technology Standards for CO2 Sources		U	U		
ES-4	NUCLEAR					
4.1	New Nuclear Capacity and Licensing		L/H	M/H		CA[AG: address possibility of hydrogen production from nuclear electricity generation
4.2	Nuclear Plant Relicensing		Zero?			
4.3	Nuclear Plant Uprating		Zero?			
ES-5	OTHER ELECTRICITY MEASURES					
5.1	Efficiency Improvements and Repowering Existing Plants		U	U		CAPAG: will be important to capture fuel cycle impacts/benefits

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5.2	Transmission System Upgrading		U	U		
5.3	Reduce Transmission and Distribution Line Loss					
5.4	Collaboration with other Southeast states		U	U		
ES-6	EMISSIONS POLICIES					
6.1	CO2 Tax		H	L/H		May need to be expanded to include emissions of other forms of carbon. CAPAG: require utilities to include a shadow price for CO2 in electric capacity planning
6.2	GHG Cap and Trade		H	L/H		
6.3	Generation Performance Standards		H	L/H		Will need to be clarified as to whether generation-only sources are envisioned
6.4	GHG Offset/mitigation requirements for new power plants		M/H	L/H		
6.5	GHG Offset/mitigation requirements for existing power plants		H	L/H		
6.6	Voluntary Utility CO2 Targets		L/M	L		
6.7	Rate restructuring					Added based on input from 11 April meeting
ES-7	EDUCATION/AWARENESS					

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7.1	Brownfield Re-development		U	U		
7.2	Environmental (emissions) Disclosure		U	U		May need to be edited or expanded and linked with emissions policies explored
7.3	Public Education		U	U		CAPAG: address the need for a broad education program that includes lifecycle costs/emissions
7.4	Codification and transfer of knowledge		U	U		
7.5	Technology and/or industrial extension services		U	U		
ES-8	INSITUTIONAL AND RD&D					
8.1	Center for low-carbon technology development		U	U		
8.2	Demonstration projects for reducing GHGs		U	U		