

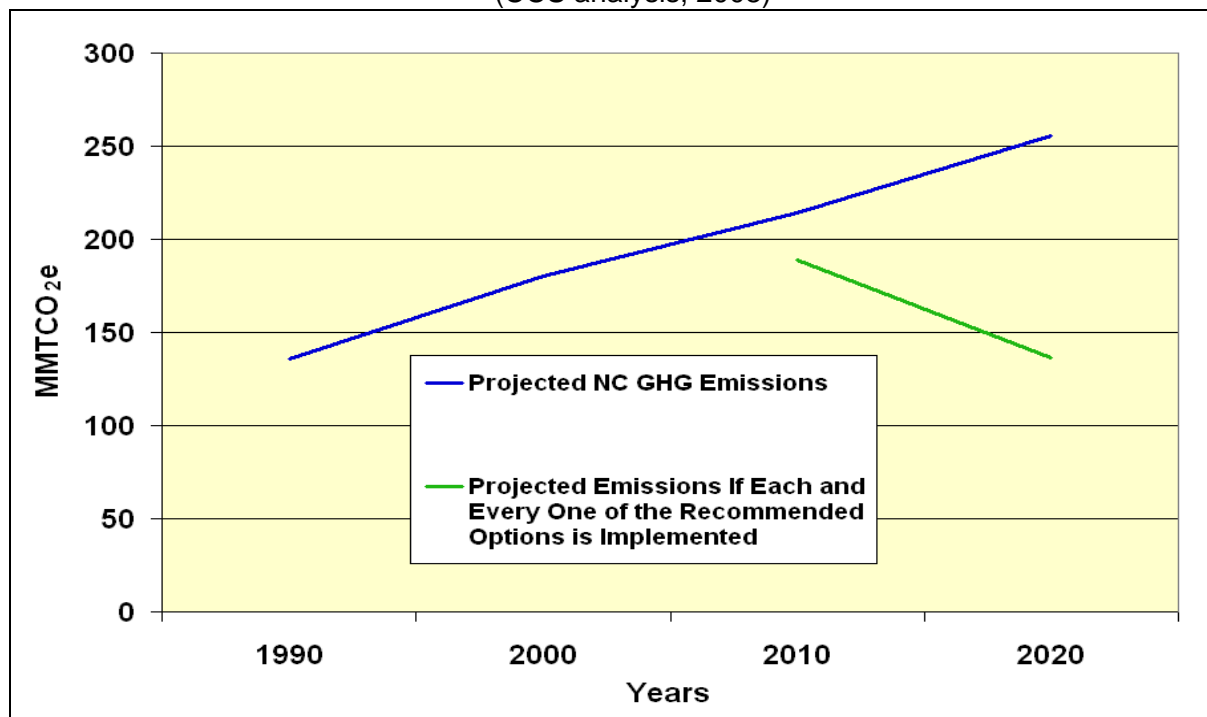


North Carolina Climate Action Plan Summary

The genesis of [North Carolina's Climate Action Plan](#) was in the state's 2005 [Clean Smokestack Act](#) (CSA) which tasked the Department of Environment and Natural Resources' (DENR) Division of Air Quality (DAQ) with studying options for reducing emissions from coal-burning power plants and other sources. The CSA Report to the General Assembly recommended a public stakeholder process to develop recommendations for GHG reductions that led to creation of the [North Carolina Climate Action Plan Advisory Group \(CAPAG\)](#) process. As a complement, the [Legislative Commission on Global Climate Change](#) (LCGCC) was created to evaluate economic impacts of global warming and a pollutant-reduction goal (in progress).

The [CAPAG](#) included 43 diverse stakeholders, coordinated by Jim Southerland of DAQ. Of the 56 options recommended by CAPAG 86% (48 options) won unanimous support; 14% (8 options) received a super majority. Fully implemented, these options could reduce gross GHG emissions by approximately 47%, from 256 million metric tons of carbon dioxide equivalent (MMtCO₂e) in the reference case forecast to 137 MMtCO₂e by 2020. Implementation of CAPAG's recommendations would thus be estimated to reduce North Carolina's gross GHG emissions to within 1% of 1990 levels by 2020.

GHG Reduction Potential from North Carolina's Recent and Proposed Actions
(CCS analysis, 2008)

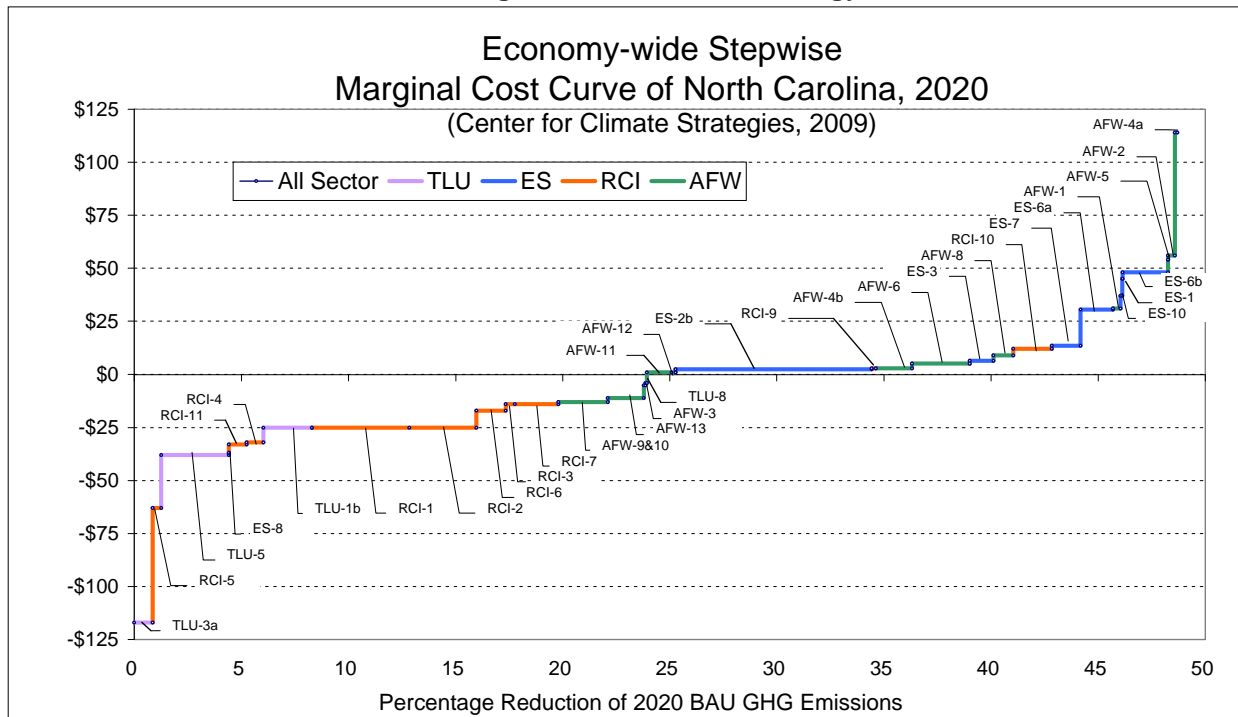


DENR and LCGCC asked the [Center for Climate Strategies \(CCS\)](#) to provide facilitation and technical and analytical support. CCS assisted CAPAG’s five Technical Work Groups (TWGs), which, in addition to the 43 CAPAG members, included 48 other knowledgeable citizens and state agency staff who contributed to the process. The TWGs include:

- [Agriculture, Forestry and Waste Conservation](#)
- [Energy Supply and Demand \(Heat and Power Generation\)](#)
- [Residential Commercial and Industrial Conservation and Efficiency \(Heat and Power Consumption\)](#)
- [Transportation and Land Use Improvements](#)

DAQ and CAPAG recognized that in a state with growing population and above average per capita emissions, preferred options for cutting greenhouse gases (GHGs) also had the long term potential to stimulate economic growth and create jobs. The cost curve below shows the cost effectiveness of many of the specific policy options in these sectors (represented by each color coded and labeled line segment) in terms of their savings or costs and their contribution to reducing GHGs. Efficiency measures in all sectors offer cost savings to the state and its citizens.

Estimated Costs and Savings for North Carolina Energy & Climate Actions



tCO₂e = metric tons of carbon dioxide equivalent; AFW = Agriculture, Forestry, and Waste Management; RCI= Residential, Commercial and Industrial [Energy Efficiency and Conservation]; TLU = Transportation and Land Use; BAU = business as usual; GHG = greenhouse gas.

Note: Negative values represent net cost savings and positive values represent net costs associated with the policy option. Results adjusted to remove overlaps between policies.

The [North Carolina Action Plan](#) is one of [30 such state plans](#) that have been completed or are underway by U.S. states. It includes a comprehensive set of sector-based policies and measures. Its design is consistent with the national climate proposal passed in the [U.S. House of Representatives](#) and supported by the Administration.

Summary Tables of Sector-Based Recommendations

The tables below list North Carolina's recommended policies by sector/Technical Work Group and show results of analyses conducted by CCS according to specifications by the Work Groups. Some policies were not quantified due to data limitations or other factors.

Key to Table Acronyms: GHG = greenhouse gas, MMtCO₂e = million metric tons of carbon dioxide equivalent, \$/tCO₂e = dollars per metric ton of carbon dioxide equivalent, N/Q = not quantified; CO₂e/MWh = carbon dioxide equivalents per megawatt-hour;

Note: Negative dollar values indicate *cost savings*. All costs are reported in 2005 U.S. dollars, net present value as of January 1, 2009. Totals in some columns may not add to the totals shown due to rounding. The numbering of policies does not reflect prioritization among the options.

Agriculture, Forestry, and Waste (AFW)						
Policy No.	Mitigation Option Name	GHG Reductions (MMtCO ₂ e)			Net Present Value 2007–2020 (Million \$)	Cost-Effectiveness (\$/tCO ₂ e)
		2010	2020	Total 2007–2020		
AFW-1	Manure Digesters & Energy Utilization	0.2	0.9	6.4	199	32
AFW-2	Biodiesel Production (incentives for feedstocks and production plants)	0.2	0.8	5.1	286	56
AFW-3	Soil Carbon Management (including organic prod. methods incentives)	0.2	0.2	3.0	–16	–5
AFW-4a	Preservation of Working Land–Agricultural Land	0.2	0.3	2.6	290	114
AFW-4b	Preservation of Working Land–Forest Land (formerly AFW-7)	1.7	4.3	36	112	3
AFW-5	Agricultural Biomass Feedstocks for Electricity or Steam Production	0.009	0.02	0.2	10	54
AFW-6	Policies to Promote Ethanol Production	0.9	6.9	38	200	5
AFW-8	Afforestation and/or Restoration of Nonforested Lands	0.2	2.4	15	128	9
AFW-9 & 10	Expanded Use of Forest Biomass and Better Forest Management	1.5	5.9	48	–639	–13
AFW-11	Landfill Methane and Biogas Energy Programs	1.1	2.9	20	23	1
AFW-12	Increased Recycling Infrastructure and Collection	0.2	0.5	4.1	52	13
AFW-13	Urban Forestry Measures	1.4	4.3	34	–376	–11
	Sector Total After Adjusting For Overlaps	7.9	29	213	270	1
	REDUCTIONS FROM RECENT ACTIONS (None)	0	0	0	0	0
	Sector Total Plus Recent Actions	7.9	29	213	270	1

Residential, Commercial, and Industrial (RCI)						
Policy No.	Mitigation Option Name	GHG Reductions (MMtCO ₂ e)			Net Present Value 2007–2020 (Million \$)	Cost-Effectiveness (\$/tCO ₂ e)
		2010	2020	Total 2007–2020		
RCI-1	Demand Side Management Programs for the RCI Sectors - Recommended Case: "Top-Ten States" EE Investment	1.9	11.6	77.1	-1,895	-25
RCI-2	Expand Energy Efficiency Funds	1.5	8.0	54.8	-1,346	-25
RCI-3	Energy Efficiency Requirements for Government Buildings	0.0	1.1	6.4	-88	-14
RCI-4	Market Transformation and Technology Development Programs	0.0	2.0	10.5	-339	-32
RCI-5	Improved Appliance and Equipment Efficiency Standards	0.0	1.0	5.3	-336	-63
RCI-6	Building Energy Codes	0.5	3.5	23.1	-400	-17
RCI-7	"Beyond Code" Building Design Incentives and Targets, Incorporating Local Building Materials and Advanced Construction	0.7	5.2	34.2	-494	-14
RCI-8	Education (Consumer, Primary/Secondary, Post-Secondary/ Specialist, College and University Programs)	Not quantified				
RCI-9	Green Power Purchasing (required for state facilities) and Bulk Purchasing Programs for Energy Efficiency or Other Equipment	0.1	0.5	3.5	11	3
RCI-10	Distributed Renewable and Clean Fossil Fuel Power Generation	1.2	4.6	33.5	392	12
RCI-11	Residential, Commercial, and Industrial Energy and Emissions Technical Assistance and Recommended Measure Implementation	0.5	2.1	14.9	-494	-33
	Sector Total After Adjusting for Overlaps	5.3	33.0	218.7	-3,994	-18
	Reductions From Recent Actions*	0.5	1.2	10.1		
RCI-1	Demand Side Management Programs for the Residential, Commercial and Industrial Sectors	0.3	0.7	6.2		
RCI-2	Expand Energy Efficiency Funds	0.2	0.4	3.6		
RCI-6	Building Energy Codes	0.0	0.0	0.0		
RCI-9	Green Power Purchasing (required for state facilities) and Bulk Purchasing Programs for Energy Efficiency or Other Equipment	0.0	0.0	0.3		
	Sector Total Plus Recent Actions	5.8	34.2	228.8		

* "Recent actions" are initiatives undertaken in North Carolina that reduce GHG emissions started shortly before or during the CAPAG process. These reductions were not accounted for in the [North Carolina Greenhouse Gas Inventory and Reference Case Projections 1990 - 2020](#). Therefore, they have been estimated separately and counted toward overall statewide reductions along with those from CAPAG's recommended mitigation options.

Energy Supply (ES)						
Policy No.	Mitigation Option Name	GHG Reductions (MMtCO ₂ e)			Net Present Value 2007–2020 (Million \$)	Cost-Effectiveness (\$/tCO ₂ e)
		2010	2020	Total 2007–2020		
ES-1	Renewable Energy Incentives	0.01	0.04	0.33	15	45.1
ES-2	Environmental Portfolio Standard					
ES-2a	Original Analysis	6.94	44.3	288.7	1,634	5.7
ES-2b	20% Combined Target	5.90	23.4	166.2	409.80	2.5
ES-2c	Load Growth Offset Target	5.53	22.3	160.3	393.95	2.5
ES-3	Removing Barriers to CHP and Clean DG	0.69	2.8	20.1	127.98	6.4
ES-4	CO ₂ Tax and/or Cap-and-Trade					
ES-4a	Electric Sector Only	0.84	3.3	20.4	119	5.8
ES-4b	Economy-wide	1.84	7.1	47.7	284	6.0
ES-5	Legislative Changes to Address Environmental and Other factors	Not quantified				
ES-6	Incentives for Advanced Coal					
ES-6a	Replacement of New 800 MW Pulverized Coal Plant	0.00	3.9	31.0	949	30.6
ES-6b	Replacement of Existing 800 MW Pulverized Coal Plant	0.00	5.4	42.9	2,061	48.1
ES-7	Public Benefit Charge	0.8	3.4	24.4	329	13.5
ES-8	Waste to Energy	0.0	0.0	0.02	–0.7	–36.8
ES-9	Incentives for CHP and Clean DG	Combined with ES-3				
ES-10	NC GreenPower Renewable Resources Program	0.01	0.2	0.95	35	37.0
	Sector Total After Adjusting for Overlaps*	6.5	62.7	375	–5.9	–0.016
	Reductions From Recent Actions (None)	0	0	0	0	0
	Sector Total Plus Recent Actions*	6.5	62.7	375	–5.9	–0.016

	Mitigation Option Name	GHG Reductions (MMtCO ₂ e)			Net Present Value 2007–2020 (Million \$)	Cost-Effectiveness (\$/tCO ₂ e)
		2010	2020	Total 2007–2020		
	Transportation and Land Use (TLU)					
TLU-1a	Land Development Planning	2.6	8.0	58.2	Net savings	
TLU-1b	Multi-Modal Transportation and Promotion (formerly TLU-2)	3.7	5.8	52.4	–1,300	–25
TLU-3a	Surcharges to Raise Revenue	1.2	2.2	15.7	–1,800	–117
TLU-3b	Rebates/ Feebates to Change Fleet Mix	0	< 0.5	2.8	Not quantified	–40 to +10
TLU-4	Truckstop Electrification	Included in TLU–8			Net savings	
TLU-5	Tailpipe GHG Standards	0	8.1	44.5	–1,150	–38
TLU-6	Biofuels Bundle	1.9	4.5	35.4	Not quantified	
TLU-7	Procure Efficient Fleets	Included in TLU–6				
TLU-8	Idle Reduction/Elimination Policies	0.1	0.2	2.2	–6	–4
TLU-9	Diesel Retrofits	0.3	2.2	13.5	Not quantified	
TLU-11	Pay-As-You Drive Insurance	2.3	5.3	42.0	Expected net savings	
TLU-12	Advanced Technology Incentives	Not quantified				
TLU-13	Buses – Clean Fuels	Included in TLU–6				
	Sector Total After Adjusting For Overlaps	11.1	25.5	232.3	–4,350	–19
	Reductions From Recent Actions (None)	0	0	0	0	0
	Sector Total Plus Recent Actions	11.1	25.5	232.3	–4,350	–19

Cross-Cutting Issues (CC)				
Policy No.	Mitigation Option Name	GHG Reductions (MMtCO ₂ e)	Net Present Value (Million \$)	Cost Effectiveness (\$/tCO ₂ e)
CC-1	GHG Inventories and Forecasts	<i>Not quantified</i>		
CC-2	GHG Reporting	<i>Not quantified</i>		
CC-3	GHG Registry	<i>Not quantified</i>		
CC-4	Public Education and Outreach	<i>Not quantified</i>		
CC-5	Adaptation	<i>Not quantified</i>		
CC-6	Options for Goals or Targets (for CAPAG in support of LCGCC)	<i>Not quantified</i>		

For details on these options, adjustments for overlaps, definitions, etc. see the North Carolina CAPAG report [Appendices](#).