

NORTH CAROLINA GENERAL ASSEMBLY



LEGISLATIVE COMMISSION ON GLOBAL CLIMATE CHANGE

FINAL REPORT TO THE GENERAL ASSEMBLY AND THE ENVIRONMENTAL REVIEW COMMISSION

MAY 2010

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TABLE OF CONTENTS

Transmittal Letter.....	5
Preface	7
Introduction	9
Commission Proceedings.....	15
Review of the Science of Climate Change.....	17
Economic Implications of Climate Change.....	23
Potential Impacts of Climate Change on North Carolina.....	25
Actions Taken in North Carolina.....	31
Actions Taken by Other States to Address Climate Change.....	51
Actions Taken Nationally and at the International Level	53
Policy Options to Consider.....	55
Other Elements of the Commission Charge	63
Commission Findings.....	65
Previously Approved Recommendations of the Commission.....	75
Recommendations for Future Consideration.....	77
Legislative Proposals.....	83
<u>Appendixes:</u>	
Appendix A: Authorizing and Extending Legislation.....	109
Appendix B: Commission Membership.....	119
Appendix C: Commission Meeting Agendas (Chronological order)	125
Appendix D: Letter from Certain Commission Members In Response to Solicitation for Recommendations.....	137
Appendix D: Summary table of CAPAG Recommended Mitigation Options.....	141

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TRANSMITTAL LETTER

TO THE MEMBERS OF THE 2010 GENERAL ASSEMBLY:

Pursuant to Section 11 of S.L. 2005-442, as amended by S.L. 2006-73, S.L. 2008-81, and S.L. 2009-306, the Legislative Commission on Global Climate Change submits this Final Report to the Environmental Review Commission and the 2010 General Assembly.

Representative Pricey Harrison
Co-Chair

Mr. John L.W. Garrou
Co-Chair

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PREFACE

The Legislative Commission on Global Climate Change was established in S.L. 2005-442 to conduct an in-depth study of issues related to global climate change. The authorizing language for the Commission is contained in Appendix A of this report. The Commission consists of 34 members, nine appointed by the President Pro Tempore of the Senate, nine appointed by the Speaker of the House of Representatives, and 16 named members, or their designees, that represent a variety of industries, organizations, and academic institutions. The full Commission membership, including past and current members, is included in Appendix B.

The Commission met on the following occasions:

February 3, 2006

March 7, 2006

April 4, 2006

April 25, 2006

October 3, 2006

November 27, 2006

December 11, 2006

January 12, 2007

February 22, 2007

October 23, 2007

December 4, 2007

January 16, 2008

February 11, 2008

March 5, 2008

April 22, 2008

November 14, 2008

December 9, 2008

January 13, 2009

November 17, 2009

January 13, 2010

March 15, 2010

April 7, 2010

May 6, 2010

Agendas for each of the Commission meetings are included in Appendix C. Copies of the presentations and handouts that were presented to the Commission are available on the Commission's website at:

<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

A complete record of the Commission's proceedings is available in the Legislative Library.

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INTRODUCTION

Background and Acknowledgments:

The Legislative Commission on Global Climate Change (Commission) was established in S.L. 2005-442 to conduct an in-depth study of issues related to global climate change. The Commission consists of 34 members, nine appointed by the President Pro Tempore of the Senate, nine appointed by the Speaker of the House of Representatives, and 16 named members, or their designees. The membership, listed in Appendix B, is broadly expert and philosophically diverse, including legislators, scientists, economists, attorneys, environmental advocates, and representatives from the energy, agriculture, forestry, and manufacturing sectors.

The Commission met in full 23 times over the course of its existence, starting in February 2006 and ending in May 2010, when this final report was adopted. Meetings were held primarily in the Legislative Office Building in Raleigh. The Commission's work was supported by central staff from the Legislative Services Office, and was greatly assisted by professionals from the Department of Environment and Natural Resources (DENR), the Department of Commerce, the Department of Transportation, the Department of Crime Control and Public Safety, and the Department of Agriculture and Consumer Services. Experts from institutions of higher education located in the State, including Appalachian State University, and Duke University, East Carolina University, North Carolina State University, the University of North Carolina at Asheville, and the University of North Carolina at Chapel Hill were frequently called upon for information and analysis. In addition, national and international experts from a variety of organizations were brought in from around the country to speak to the Commission to help inform its deliberations.

The time committed to this process by the members of the Commission has been significant. Many of the Commission members presented information and issue items to the Commission, provided recommendations for the Commission to consider, and participated in the discussions of the Commission's findings, recommendations, and legislative proposals. The work of the Commission represents the first comprehensive analysis by a legislative body of climate change issues facing North Carolina to date.

The Commission applauds Senator Charles Albertson for being the primary sponsor of the legislation to establish the Commission (Senate Bill 1134, 2005 Session) and appreciates the General Assembly's decision to enact the legislation and support the efforts of the Commission over the past four years. The Commission also appreciates the leadership of its co-chairs, including John Garrou from 2006 to 2010, Representative Joe Hackney from 2006 to 2007, and Representative Pricey Harrison from 2007 to 2010.

Need for State Action:

Since climate change is a global problem, national and international solutions are needed in order to achieve the most significant reductions in greenhouse gas emissions. However, because the

effects of climate change on North Carolina will be significant, the General Assembly should not wait for national or international action before responding to these threats. Moreover, many of steps to reduce greenhouse gas emissions will require state action.

The Commission believes that the actions taken by states can have a significant effect on global greenhouse gas levels. The important role states can serve in addressing climate change is illustrated by data from the World Resources Institute indicating that the combined emissions of eight southeastern states (Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia) are greater than all but four countries in the world.¹

The Commission urges the General Assembly to give serious consideration to the findings and recommendations included in this report and to act quickly with regard to the legislative proposals. The Commission hopes that other institutions and agencies involved in climate change deliberations in North Carolina, whether legislative or executive, find the information in the report instructive and useful.

Commission Charge:

The original enabling legislation for the Commission, S.L. 2005-442, provided the Commission with the following purposes and duties:

- (1) *The Commission shall conduct an in depth examination of issues related to global climate change. This examination shall include all of the following:*
 - a. *A review of current scientific literature on the possible natural and anthropogenic causes of global climate change.*
 - b. *A review of actions taken by the federal government and by other states to address global warming.*
 - c. *An examination of the emissions of greenhouse gases from within the State and the extent to which reductions in the emissions of these gases in the State, region, nation, and worldwide could be expected to affect global climate change.*
 - d. *An evaluation of the economic opportunities for the State that may result from international, national, and State action to address global climate change and the emerging carbon market.*
 - e. *The potential impacts of global climate change on the citizens, natural resources, and economy of the State, including agriculture, travel and tourism, recreation, coastal real estate, insurance, and other economic sectors.*
 - f. *The costs of any action taken by the State to address global climate change on individuals, individual households, local governments, businesses, educational institutions, agricultural operations, the State government, and other institutions and economic sectors.*

¹ Damassa, T. 2009. Energy by the Numbers (Data Supplement). Washington, DC: World Resources Institute. Available online: <http://www.wri.org/publication/southeast-energy-policy>.

- g. *The benefits of any action taken by or within the State or other states and at the national or international levels to address global climate change on individuals, individual households, local governments, businesses, educational institutions, agricultural operations, the State government, and other institutions and economic sectors.*
- (2) *If, in the course of its examination, the Commission determines that it would be appropriate and desirable for the State to establish a global warming pollutant reduction goal, the Commission may develop a recommended global warming pollutant reduction goal for the State.*
- (3) *In conducting its examination of global climate change, the Commission shall consider and integrate the findings and recommendations of the study of issues related to the development and implementation of standards and plans to control emissions of carbon dioxide required by Section 13 of S.L. 2002-4.*

This charge formed the basis for all of the activities of the Commission. The Commission did not start with a set agenda or any assumptions about climate change. Instead, the Commission attempted to develop a common foundation of information on these topics from which formal recommendations and legislative proposals, if needed, could be developed. To accomplish this task, the Commission proceeded using the following basic framework:

- (1) A thorough review of the science of climate change.
- (2) Discussion of the economic implications of climate change.
- (3) Evaluation of potential impacts of climate change on North Carolina.
- (4) Analysis of actions taken to date in North Carolina.
- (5) Review of actions taken by other states to address climate change.
- (6) Review of actions taken or pending at the international and national level.
- (7) Discussion of policy options to consider in North Carolina.

The activities of the Commission are described in greater detail in the Commission Proceedings section of this report. The agendas from each of the Commission's 23 meetings are listed in Appendix C.

Input from the North Carolina Climate Action Plan Advisory Group (CAPAG):

During the time the Commission was meeting, a parallel process was underway in North Carolina. Section 13 of the 2002 Clean Smokestacks Act (S.L. 2002-4) directed the Division of Air Quality of DENR to "study issues related to the development and implementation of standards and plans to control emissions of carbon dioxide (CO₂) from coal fired generating units and other stationary sources of air pollution" and to "evaluate available control technologies and ...estimate the benefits and costs of alternative strategies to reduce emissions of CO₂." The Division of Air Quality issued its final report pursuant to this study in 2005 and included as one of its recommendations that a public stakeholder process should be started to continue greenhouse gas mitigation planning in the State. Based on this recommendation, DENR embarked on the process of establishing the North Carolina Climate Action Partnership Advisory Group (CAPAG). The CAPAG process culminated with the release of a final report in October 2008 entitled "Recommended Mitigation Options for Controlling Greenhouse Gas Emissions."

The report included a comprehensive analysis of various mitigation options related to climate change, including 56 recommended options that are believed to be the most important for mitigating greenhouse gas emissions in North Carolina.

During the Commission's proceedings, the participants and facilitators in the CAPAG process frequently presented and contributed information to the Commission's discussions. The detail and analysis in the CAPAG report was very beneficial to members of the Commission and the CAPAG recommendations formed the framework for much of the Commission's discussions on policy options. A table of the CAPAG recommendations and actions taken in response to those recommendations is included at Appendix E. The CAPAG final report and many supplemental materials are available online at: <http://www.ncclimatechange.us/capag.cfm>.

Interim report by the Commission

The Commission prepared a draft interim report in February 2007 that provided a preliminary overview of the activities taken by the Commission. As part of its development of the interim report, the Commission discussed and approved 17 early action recommendations suggested by CAPAG for inclusion in the report. Although the interim report was never submitted to the General Assembly by the Commission, the recommendations that were approved for inclusion in the interim report are included in the Previously Approved Recommendations section of this report.

Development of the Final Report

Following the Commission's investigational work, the Commission developed a set of findings that could be drawn from the information gathered by the Commission. These findings are listed in each section of the Commission proceedings and are also summarized in the Findings section of this report. In addition, the Commission members submitted over 100 possible policy recommendations for the Commission to consider. The comments submitted by Commission members during this time are available on the Commission website. Following discussion of these items at the March and April 2010 meetings of the Commission, a list of recommendations for future consideration was adopted by the Commission, and several legislative proposals were also developed. The recommendations for future consideration and the legislative proposals are provided at the end of this report.

How to Interpret the Commission's Actions on this Report

In adopting this final report, Commission members endorsed the need to take actions to reduce greenhouse gas emissions and adapt to changes in North Carolina's climate. However, the issuance of this report does not reflect unanimity among Commission members on the selected findings, recommendations, or legislative proposals. Instead, it simply means that the majority of the Commission members agreed with most of what is contained in the document. Commission members' reservations reflect the complexity of the issues that the Commission faced, including the time scale involved, the ongoing debates at the international and federal level, and remaining questions about the uncertainty of the science.

While the Commission attempted to find common ground on climate change issues, in other cases the position taken by some Commission members was irreconcilable with the position taken by the majority of the Commission members. As an example, a portion of the Commission's membership did not feel that there was a need for the State to take further action on climate change at this time. A letter expressing this viewpoint was submitted by several members of the Commission on February 5, 2010, and a copy of the letter is included in this report as Appendix D. The differences in perspectives among the Commission member is also highlighted in the comments submitted to the Commission in February and March 2010, which are available on the Commission website at the following links:

- [February 5, 2010 Comments and Proposed Recommendations](#)
- [March 15, 2010 Comments on Report and Recommendations](#)

Testimony and presentations made before the Commission were from many perspectives, including some disputing the basic premise of climate change and the underlying science on which most climate change projections are based. The information presented to the Commission was not necessarily endorsed by each Commission member, but was again designed to provide for a thorough and full discussion of the issues involved in the climate change debate.

Difficulty in Quantifying Costs and Benefits

It is important to note that Commission members would have been more comfortable with the recommendations if more specific information regarding the quantifiable costs and benefits had been available. The CAPAG process and some of the presentations received by the Commission provide useful information on the costs and benefits of various policy recommendations, but detailed analysis of each recommendation was not possible given the time and resource constraints on the Commission. Additional analysis of cost issues will be part of the task of the General Assembly in considering the recommendations and the agencies tasked with implementing the recommendations in the report.

References to Pending Legislation

Bills referenced in this report are primarily for illustrative purposes only and should not be interpreted as an endorsement of that legislation by the Commission.

Commission Action on the Findings

The Commission's findings were voted on as a whole set.

Commission Action on the Recommendations for Future Consideration

The recommendations for future consideration were voted on as a whole set. These recommendations include items submitted by Commission members as proposals that have merit as mitigation or adaptation policy alternatives, but lacked sufficient detail, dealt with issues that were already being addressed in another forum, or were sufficiently controversial that they

lacked the general support necessary to be considered as a legislative proposal by the Commission.

Commission Action on the Legislative Proposals

The legislative proposals were voted on individually, not as a set. The proposals that received approval of the Commission are included in the Legislative Proposals section of this report.

Post-Report Positions by Commission Members

As noted, most Commission members agree with most of what is contained in this report. However, Commission members are free, as they have been throughout the Commission's deliberations, to rely on the testimony of specific presenters and the findings and recommendations that they find most persuasive and credible. Now that the Commission's work is complete, members remain free to express their own opinions on the report's findings, recommendations, and legislative proposals as they are debated in the future in various forums.

COMMISSION PROCEEDINGS

The Commission conducted a thorough review of climate change issues, including the receipt of over 90 presentations from more than 60 different speakers. In general, the topics that were considered fall within the following categories, each drawn from the Commission's charge:

- Review of the science regarding the causes of climate change.
- Review of the potential impacts of climate change.
- Economic implications and opportunities related to climate change.
- Actions taken in North Carolina.
- Actions taken internationally, at the national level, and by other states.
- Discussion of possible policy options.

These items are discussed in further detail in the following sections:

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REVIEW OF THE SCIENCE REGARDING THE CAUSES OF CLIMATE CHANGE

S.L. 2005-442(1)(a) directed the Commission to conduct a "review of current scientific literature on the possible natural and anthropogenic causes of global climate change." The Commission focused much of its early attention on establishing a base level of understanding of climate change science and the debate over the causes of climate change. The following presentations were focused on developing this background level of understanding on climate change science.

February 3, 2006:

- Dr. William H. Schlesinger, Dean of the Nicholas School of Environmental and Earth Sciences, Duke University and James B. Duke Professor of Biogeochemistry, gave a presentation on the state of the science related to global climate change. His presentation covered carbon dioxide and the atmosphere and its effect on climate and also considered various kinds of effects this may have on the future economics of this State and on the people who live in this State. Dr. Schlesinger asserted that a correlation between carbon dioxide levels and temperature exists and supported the theory that the rise in carbon dioxide levels is due to human activities including fossil fuel combustion and forest destruction. He referenced a statement from the American Geophysical Union, the Nation's premier society of more than 10,000 earth scientists, which says the temperature of the planet is warming and humans are responsible for warming above and beyond any natural variability one may expect. He presented satellite data that showed warming of about two degrees centigrade in the Northern Hemisphere, Alaska, Canada, Northern Europe, and Siberia. He also said that the increase in global surface air temperature is predicted to be between five to nine degrees Fahrenheit by 2060. Dr. Schlesinger discussed the impacts of climate change on sea level rise, the distribution of trees, rainfall patterns, malaria, and hurricane intensity and frequency.
 - [William H. Schlesinger, Dean, Nicholas School of Environmental & Earth Sciences, Duke University, James B. Duke Professor of Biogeochemistry.](#)

March 7, 2006

- Dr. Robert Balling, from Arizona State University presented on the state of the science related to global climate change. He asserted that there was no doubt in the scientific community that the earth's temperature is rising, that an anthropogenic signal exists. He then talked about the geological temperature record and addressed the effects of climate change on hurricanes and sea levels. Dr. Balling said that there was no evidence about what will happen to the intensity and frequency of tropical storms as a result of climate change. Although he agreed that sea levels are rising, he pointed out that they have been rising for the last 8000 years. He concluded by saying that he is skeptical that much could be done in North Carolina to impact the carbon dioxide levels of the atmosphere.
 - [Robert C. Balling, Jr., Professor, Department of Geography, Arizona State University](#)

- Dr. Stanley Riggs is a member of the Commission and Distinguished Research Professor in the Department of Geology at East Carolina University. He discussed climate and sea level change, storm and coastal dynamics, beach erosion, and shorelines changes with a particular focus in North Carolina. He asserted that the impact of climate change could be very dramatic, particularly in eastern North Carolina where elevation in some counties is only a foot or two above sea level. Sea levels are rising 1.5 feet per century and are predicted to rise to 3 feet per century, which could cause North Carolina to lose as much as thirty to forty percent of its Coastal Plain leading to significant loss of land and significant economic loss. He discussed beach, marsh, and wetland erosion in the state: North Carolina's beaches are eroding in response to rising sea level that averages from three to fifteen feet per year. With regard to tropical storms, Dr. Riggs pointed out that between 1993 and 2005, mid-Atlantic coastal areas experienced the highest tropical storm activity in recorded history.
- Dr. Robert Jackson is a Professor of Biology and Professor of Environmental Science at the Nicholas School of the Environment Earth Science at Duke. He directs the Center on Global Change and the new Department of Energy called Southeastern Regional National Institute for Climate Change Research. He discussed the direct link between human activity and greenhouse gases on the earth's rising temperature. Dr. Jackson pointed out that the Intergovernmental Panel on Climate Change (IPCC), the American Geophysical Union, the National Academy of Sciences, and the American Association for the Advancement of Science all agree that there is a direct link between human activity, greenhouse gases, and warming of the earth. Dr. Jackson provided data, graphs, and references to support his assertions. The graphs illustrated that greenhouse gases and temperature were rising and suggested a correlation between the two. He asserted that in order to stabilize carbon dioxide levels, carbon dioxide emissions would have to be reduced dramatically.
 - [Robert B. Jackson, Jr., Faculty Director, Center on Global Change; Professor of Biology and Environmental Sciences, Duke University](#)
- Dr. Sethu Raman, a member of the Commission is also the State Climatologist. Dr. Raman is a Professor of Meteorology in the Department of Marine, Earth, and Atmospheric Sciences at North Carolina State University. His presentation focused mostly on temperature and precipitation trends in North Carolina. Dr. Raman provided the history of the State Climate Office in North Carolina, in addition to its mission and involvement in various projects. The State Climate Office's mission is to provide the most accurate climate information to the citizens of North Carolina and assist North Carolina State agencies in climate, environmental issues, and other obligations. His presentation addressed the regional and local change in the climate in North Carolina. He presented results on short and long terms climate trends in the State. Based on the data that has been collected, short term trends indicate warming along the coast, cooling in central North Carolina, a deficit in precipitation in the northern coastal part of North Carolina, and an increase in precipitation in the southern part of North Carolina. Dr. Raman asserted that the density of climate observations needed to be improved in order to be confident about observed trends.

- [Sethu Raman, State Climatologist and Professor of Meteorology, Department of Marine, Earth, and Atmospheric Sciences, North Carolina State University](#)

April 2006:

Discussion of the state of the science related to global climate change:

- Mr. David R. Easterling, Chief, Scientific Services Division, National Climatic Data Center, National Oceanic and Atmospheric Administration (NOAA), Asheville, North Carolina, was the first speaker on the state of the science related to global climate change.
- He provided evidence showing how the climate has changed over the last 100 years and showed examples of observed climate change. Temperature data indicates that global temperatures have risen approximately 0.7 percent centigrade since the 1800's. Although it is unclear if global warming is a contributor, global precipitation appears to have increased since the late 1800's. Hurricanes have increased with oscillations in ocean temperatures, sea ice has decreased, snow cover has decreased, and changes in the number of frost days and days exceeding other thresholds. All of these examples point to warming. Mr. Easterling also discussed climate models and some of the results they have produced; in addition to pointing that out clouds are sources of the largest uncertainties in climate models.
 - [David R. Easterling, Chief, Scientific Services Division, National Climatic Data Center, National Oceanic and Atmospheric Administration \(NOAA\) Asheville, North Carolina](#)
- Patrick J. Michaels, Ph.D., Research Professor and State Climatologist, Virginia State Climatology Office, University of Virginia, Charlottesville, Virginia, presented his view of the state of the science related to global climate change data. He asserted that there is bias and polarization on climate change that is presented to the public. Dr. Michaels presented some global warming and cooling data and information on hurricanes. His solution to the questions on global warming is that Kyoto is expensive and causes long-term economic problems. Dr. Michaels advocated for encouraging global economic development and adaptation to climate change, rather than prevention of climate change. He believes money is better spent adapting to the changes caused by climate change rather than preventing climate change.
 - [Patrick J. Michaels, Research Professor and State Climatologist, Virginia State Climatology Office, University of Virginia, Charlottesville, Virginia](#)
- William L. Chameides, Ph.D., Chief Scientist, Environmental Defense, New York, gave a presentation on the state of the science related to global climate change. He supported the view that the increase in carbon dioxide is caused by human activity and that the earth is warming. He asserted that a temperature increase of two degrees centigrade is likely to be the tipping point (i.e. an irreversible point where it will be impossible for the climate system to recover) for loss of the Greenland ice sheet, loss of the Amazon tropical rainforest, and the melting of permafrost and release of greenhouse gases from the permafrost. Dr. Chameides believed that in order to avoid this 2 degrees centigrade temperature increase, emissions need to be stabilized globally and the United States must cap greenhouse gas emissions at about 10 percent of current levels. He promoted a market based cap and trade program and referenced a paper by Pacala and Socolow that

lists 15 existing technologies that could help decrease emissions by 40 to 60 percent of current levels.

- [William L. Chameides, Chief Scientist, Environmental Defense, New York, New York](#)
- Michael MacCracken, Ph.D., Chief Scientist for Climate Change Programs, Climate Institute, Washington, D.C. gave his presentation on understanding and projecting climate change. He discussed the impacts and potential impacts of climate change. First he discussed the efforts made in California and New York. Then Dr. MacCracken showed highlights of a study that looked at the consequences, both good and bad, of reducing fossil fuel consumption in the southeastern United States. Key issues that came up for the southeast regional assessment were what it would do to agriculture, forests, water quality, air quality, and extreme events. Dr. MacCracken also discussed coastal issues, coral reefs, ecosystems, water distribution, health effects, and the potential impacts on infrastructure.
 - [Michael C. MacCracken, Chief Scientist for Climate Change Programs, Climate Institute, Washington, D.C.](#)

December 11, 2006:

- Reverend Michael Cogsdale, the President of the North Carolina Council of Churches and the Rector of Saint James Episcopal Church in Lenoir, presented some perspectives on global climate change from the faith community of North Carolina. The North Carolina Council of Churches represents 25 denominational bodies and 1.5 million people of faith in the State. There has been a movement among the mainline denominations in the past twenty years to develop a new appreciation for the natural environment and a renewed understanding of the sacred writings which call for a commitment to the stewardship of creation. Because the threat of climate change is global and will likely impact the poor and vulnerable the most, it touches on a spiritual problem for communities of faith, in that they must work for the common good of all people. Also, congregations see the care of creation as a religious duty and are looking for ways to respond and channel their desire to care for creation into actions. In North Carolina, the faith community is responding to climate change by promoting renewable energy, energy efficiency, and conservation through their affiliation with the Interfaith Power and Light Campaign, by increasing educational opportunities to understand the relationship between love for God and care for Creation, by forming interfaith coalitions on climate change issues, by conducting energy audits, and reducing energy use. In closing, Rev. Cogsdale stated that the constituents of the North Carolina Council of Churches are also those of the General Assembly, and that these same people care about the earth beyond the price of gasoline. As a representative of this large organization, Rev. Cogsdale requested that the Commission's recommendations be significant and based on the long-term appraisal of nature's laws and not only the short-term economic gain.
 - Michael H. Cogsdale, President, North Carolina Council of Churches and Rector at St. James Episcopal Church in Lenoir, North Carolina

January 16, 2008:

- Preparation for the 11 February 2008 meeting of the Commission: Summary of the "Synthesis Report from Climate Change 2007" prepared by the Intergovernmental Panel on Climate Change (IPCC)
 - [Dolores M. "Dee" Eggers, Commission member and Associate Professor, Department of Environmental Studies, University of North Carolina at Asheville](#)

February 11, 2008:

- Presentation on the state of the science on global climate change, what developing countries are doing to address climate change in relation to what the United States and other industrialized countries are doing and should do in this regard, and what the State of North Carolina should do with regard to climate change
 - [Dr. Rajendra Pachauri, Chair, Intergovernmental Panel on Climate Change, and Director General, The Energy and Resources Institute](#)

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REVIEW OF THE POTENTIAL IMPACTS OF CLIMATE CHANGE

In addition to evaluating the causes of climate change, the Commission evaluated the "potential impacts of global climate change on the citizens, natural resources, and economy of the State, including agriculture, travel and tourism, recreation, coastal real estate, insurance, and other economic sectors." (S.L. 2005-442 (5)(1)(e)). The Commission evaluated this issue as follows:

Global impacts:

January 12, 2007:

- Discussion of the effects of global climate change as they relate to coastal adaptation
 - Discussion of coastal vulnerability to erosion, storm hazards, and potential sea-level rise
 - [S. Jeffress Williams, Coastal Marine Geologist, United States Geological Survey, Woods Hole Science Center](#)
 - Presentation of the National Academy of Sciences report Mitigating Shore Erosion along Sheltered Coasts
 - [Debra Hernandez, President, Hernandez and Company](#)

January 16, 2008:

- Summary of the "Synthesis Report from Climate Change 2007" prepared by the Intergovernmental Panel on Climate Change (IPCC)
 - [Dolores M. "Dee" Eggers, Commission member and Associate Professor, Department of Environmental Studies, University of North Carolina at Asheville](#)

February 11, 2008:

- Presentation on the state of the science on global climate change, what developing countries are doing to address climate change in relation to what the United States and other industrialized countries are doing and should do in this regard, and what the State of North Carolina should do with regard to climate change
 - [Dr. Rajendra Pachauri, Chair, Intergovernmental Panel on Climate Change, and Director General, The Energy and Resources Institute](#)

Impacts on North Carolina:

January 12, 2007:

- Discussion of the projected impacts of global climate change on coastal ecosystems in North Carolina
 - [Douglas N. Rader, Principal Scientist for Oceans and Estuaries, Environmental Defense](#)
- Discussion of the implications of sea level rise for coastal development policy

- [Courtney T. Hackney, Chair, Coastal Resources Commission](#)
- [Walter Clark, Coastal Community and Policy Specialist, North Carolina Sea Grant](#)

January 16, 2008:

- Presentation of the report: "Measuring the Impacts of Climate Change on North Carolina Coastal Resources" prepared for the National Commission on Energy Policy
 - [Christopher F. Dumas, Associate Professor, University of North Carolina at Wilmington](#)
- Presentation of the report: "When it Rains, it Pours: Global Warming and the Rising Frequency of Extreme Precipitation in the United States" prepared by Environment America
 - [Travis Madsen, Policy Analyst, Frontier Group, Environment North Carolina](#)

November 14, 2008:

- Discussion of global warming adaptation strategies to conserve fish and wildlife habitats and maintain healthy and genetically diverse wildlife populations
 - [Michael R. Bryant, Project Leader, North Carolina Coastal Plain Refuges Complex, Alligator River National Wildlife Refuge](#)
- Presentation on estuarine shoreline erosion and coastal hazards in the changing climate of North Carolina
 - [Dr. D. Reide Corbett, Ph.D., Associate Professor and Assistant Chair](#)
 - [Dr. J.P. Walsh, Ph.D., Assistant Professor, East Carolina University](#)

December 9, 2008:

- Presentation of the report "North Carolina Coasts in Crisis: A Vision for the Future"
 - [Stephen J. Culver, Professor and Department Chairperson](#)
 - [David J. Mallinson, Associate Professor, Department of Geological Sciences, East Carolina University](#)

March 15, 2010

- Summary of the Coastal Resource Commission's Science Panel Report on projected levels of sea level rise along the North Carolina coast; Presentation of the findings of the Division of Coastal Management's Sea Level Rise Scoping Survey
 - Tancred Miller, Coastal Policy Analyst, Division of Coastal Management, DENR

ECONOMIC IMPLICATIONS AND OPPORTUNITIES RELATED TO CLIMATE CHANGE

S.L. 2005-442(5)(1)(d) directed the Commission to evaluate the economic opportunities for the State that may result from “international, national, and state action to address global climate change and the emerging carbon market.” In addition, subdivisions (f) and (g) directed the Commission to evaluate the following:

- "f. The costs of any action taken by the State to address global climate change on individuals, individual households, local governments, businesses, educational institutions, agricultural operations, the State government, and other institutions and economic sectors.
- g. The benefits of any action taken by or within the State or other states and at the national or international levels to address global climate change on individuals, individual households, local governments, businesses, educational institutions, agricultural operations, the State government, and other institutions and economic sectors."

The Commission evaluated these economic implications and opportunities at the following meetings:

April 4, 2006:

Discussion of activities taken by businesses in the State and the United States to address global climate change:

- Mr. Truman T. Semans, Director for Markets and Business Strategy, Pew Center for Global Climate Change, Washington, DC, was the first of four speakers to report on activities taken by businesses in the State and nationwide to address global climate change. Mr. Semans explained how climate and energy fit into corporate business strategies including reducing greenhouse gas emissions; capturing competitive advantage in a business opportunity associated with climate change; and constructive, external engagement. Mr. Semans concluded by saying that there are two broad approaches a company can take to reduce greenhouse gas emissions—(1) promote energy efficiency and reduce greenhouse gas emissions from operations , (2) reduce the broad footprint of the products and services that a company makes.
 - [Truman T. Semans, Director for Markets and Business Strategy, Pew Center on Global Climate Change, Washington, D.C.](#)
- Mr. Robert L. Kee, Senior Vice President, Document Management, Bank of America (BOA), Charlotte, North Carolina, gave his and Bank of America’s views on the issue of global climate change. He pointed out that BOA is committed to the long-term sustainability of their business and that of the communities they serve. He listed many actions BOA is taking to address sustainability including: setting a goal to reduce paper

consumption by 25 percent over three years: setting a voluntary goal with the EPA to reduce greenhouse gases by 9 percent by 2009 (based on a 2004 benchmark); and launching the Electronification of Paper Program.

- Robert L. Kee, Senior Vice President, Document Management, Bank of America, Charlotte, North Carolina
- Mr. William F. Bailey, Principal Consultant, DuPont, Charlotte, North Carolina, gave a presentation on DuPont's activities with regard to addressing global climate change. Mr. Bailey said that the challenge for DuPont is to address issues such as climate change in a way that makes business sense, upholds its core values, and sustainable growth. Mr. Bailey discussed some of the measures DuPont had undertaken to address climate change. DuPont committed to reduce their greenhouse gas emissions by 65 percent versus a 1990 baseline, hold total energy use, flat, versus a 1990 baseline, and supply 10 percent of their total energy needs from renewable resources at a cost, competitive with the best fossil-derived alternatives. DuPont also provides a broad array of enabling technologies, such as making bio-fuels and bio-based raw materials, which can help their customers reduce their greenhouse gas emissions footprint.
 - [William F. Bailey, Principal Consultant, DuPont, Charlotte, North Carolina](#)
- Mr. Tom Darden, Chief Executive Officer, Cherokee Investment Partners, Raleigh, North Carolina, spoke about Cherokee Investments' efforts to address global climate change. Cherokee's primary role is to treat fuel contaminated soil, mostly with bacteria by remediation. Cherokee also tries to have some input into what is built on the sites they clean up.
 - [Thomas Darden, Chief Executive Officer, Cherokee Investment Partners, Raleigh, NC](#)

April 25, 2006:

Joseph E. Aldy, a Fellow with Resources for the Future, discussed the primary determinants of mitigation costs and the issues to consider in order to project how the economy, individuals, and firms respond to a climate change policy in order to reduce their emissions of greenhouse gases. Mr. Aldy discussed determinants of mitigation costs, opportunities for investing in more energy efficient technology, and cost implications of policy design. He also explained how one might address uncertainty and risk when designing climate change policy. Mr. Aldy presented examples of successful cap and trade programs, such as the acid rain program. He also discussed different kinds of cap and trade programs and other policy options in the United States and Europe, ranging from moderate to stringent reductions in carbon dioxide, and how they would impact the economy. Finally, Mr. Aldy highlighted ancillary benefits that would likely result from addressing climate change, such as improved air quality and reduced congestion and traffic accidents.

- Joseph E. Aldy, Fellow, Resources for the Future, Washington, D.C.

Dr. John C. Whitehead, Associate Professor at the Department of Economics at Appalachian State University talked about what the cost might be if climate change is not mitigated. Dr. Whitehead estimated the damages to North Carolina based on an annual one percent change,

which could be the lowest amount of damages North Carolina may face; the total is 34 million dollars in health impacts and 17 million dollars in environmental impacts. This is approximately 50 million dollars in total damages, which is about 0.2 percent of State personal income and approximately 16 dollars per North Carolina household. He estimated the costs to human health including heat and storm related deaths, non-melanoma skin cancers, and drinking water contamination. He also estimated costs associated with damaged wetlands, beach erosion, commercial fishing, hurricane damage, and increased probability of extinction for coastal threatened and endangered species.

- John C. Whitehead, Associate Professor, Department of Economics, Appalachian State University, Boone, North Carolina

Margo Thorning, Vice-President and Chief Economist of the American Council for Capital Formation, explained what some of the models have shown in terms of cost of trying near term of emission reductions. In addition she discussed what is going on in Europe and how their system is working. Specifically, Ms. Thorning looked at how the European Union is conducting their emissions trading system. Ms. Thorning discouraged the use of a cap and trade program in North Carolina and encouraged that a cost-benefit analysis be conducted before adopting any mandatory policies or further policies to address greenhouse gas emission reduction. She asserted that it is essential that research and development be increased. Ms. Thorning also discussed what other countries, such as China and India, are doing to address climate change.

- Margo Thorning, Vice President and Chief Economist, American Council for Capital Formation, Washington, D.C.

November 27, 2006:

Tim Toben, a member Commission and the Chief Executive Officer of Carolina Green Energy Corporation presented an overview of two recent reports on the economic impacts of climate change.

- The Stern Review Report on the Economics of Climate Change, was produced in Great Britain by Sir Nicholas Stern, the Head of Government Economic Services. The study was based on data from the Hadley Center in the United Kingdom, the Energy Forum, the United States Climate Change Science Program, and the Intergovernmental Panel on Climate Change. The conclusions of the report are that the world faces tremendous costs from climate change by delaying action, close to losing five percent of the global Gross Domestic Product (GDP), and that mitigating climate change now is less than 1 percent of the global GDP. Some of the findings include: a decline in crop yields and food shortages; water shortages and flooding; not reducing now would result in double the concentrations of greenhouse gas by 2035 from the pre-industrial level; the benefits in shifting the world to a low carbon path now would be on the order of 2.5 trillion dollars. The report listed several recommendations, including the fact that acting now still offers the potential to avoid the worst impacts of climate change. Moving ahead with actions should include: forming collaborative partnerships among governments, business and individuals; creating effective policy at the state and national level; stabilize energy levels emissions over the next 20 years and between 1 and 3 percent after that; trade agreements to detect the effectiveness of investment and innovation globally; reduce deforestation; and integrating climate change into development policies. The report also emphasized carbon pricing, taxation, emissions trading or regulation, and technology policy as

driving the development and large scale deployment of low carbon and high efficiency products, promotion of energy efficiency, removal of barriers to energy efficiency.

- [Stern Review Report on the Economics of Climate Change, Her Majesty's Treasury, United Kingdom](#)
- The second report, Mr. Toben reviewed was Impacts on U.S. Energy Expenditures of Increasing Renewable Energy Use, by the RAND Corporation. This report lays out the results of a modeling scenario where the United States incorporates 25 percent renewable energy sources into its energy mix by 2025. The study was built on data from energy demand and supply projections from the U.S. Energy Information Administration. Results and recommendations are based on the analysis of 1500 test runs that varied future costs and rates of technology changes for fossil fuels and renewable energy. What the RAND Corporation found is that when renewable energy is at 25 percent of the total energy mix, the total energy expenditures were lower in nearly all cases, where current energy price and cost trends were business as usual. Additionally, as long as renewable technology continues to improve at least 20 percent in the next 20 years, renewables could produce 25 percent of U.S. electric power and 10 percent of motor vehicle fuels by 2025 with no additional costs to the economy. Some of the positive effects of incorporating 25 percent renewables into our energy mix include: a 2.5 million barrel per day cut in U.S. petroleum consumption, or about 10 percent of projected U.S. consumption; the elimination of one giga ton of carbon dioxide emissions, resulting in a 50 percent reduction in U.S. contributions to global warming and a reduction in air pollution; and an increase in jobs and economic growth in rural communities. Still, there are several challenges to using renewables such as intermittency, transmission, interconnection, supply, as well as the costs, which are expected to decline by 45 percent in the next 20 years.
 - Impacts on U.S. Energy Expenditures of Increasing Renewable Energy Use, RAND Corporation
 - [Tim Toben, Member, Legislative Commission on Global Climate Change and Chief Executive Officer of Carolina Green Energy Corporation](#)

December 11, 2006:

- The Honorable Richard H. Moore, North Carolina's State Treasurer, present on the investment policy of North Carolina as it relates to global climate change. Treasurer Moore is the sole fiduciary of the State's public pension funds, over \$70 billion in assets, which he invests on behalf of the State. The investment strategy usually is as such: 58 percent in public equities, 35 percent in fixed income, and less than 5 percent in real estate and alternatives. Because of the amount of money which North Carolina has invested in public equities, good corporate governance and transparency in publicly traded companies is extremely important. One area in particular which the North Carolina Treasurer's office has focused on within corporate governance and transparency, is the issue of global warming, specifically carbon emissions. If the company that the Treasurer's office has bought stock in is, for example, an insurance or an oil and gas company, they want to know if they are properly valuing their liabilities. If not, then the company is not being run in a responsible way, a way to reward the ultimate long term share holders or public pension funds. Mr. Moore pointed out that though the shareholder has no say in the day-to-day running of a company, they do by extension, through the

Board of Directors, whose job it is to run the company. The shareholders and money managers thus have the right and responsibility to ask questions and expect answers of the companies. They have a responsibility to challenge companies about their environmental impacts.

- [Richard H. Moore, State Treasurer, North Carolina](#)

October 23, 2007:

- Presentation of draft preliminary results of a macroeconomic analysis conducted on various climate mitigation options recommended by CAPAG
 - [David W. Ponder, Graduate Research Assistant, Department of Political Science/Criminal Justice, College of Arts and Sciences, Appalachian State University](#)

April 22, 2008:

- Presentation of final results of the macroeconomic analysis conducted on various climate mitigation options recommended by Climate Action Plan Advisory Group (CAPAG)
 - [David W. Ponder, Graduate Research Assistant, Department of Political Science/Criminal Justice, College of Arts and Sciences, Appalachian State University](#)
- Presentation on the economics of climate change legislation in North Carolina
 - [David G. Tuerck, Executive Director, Beacon Hill Institute for Public Policy Research, and Professor and Chairperson, Economics Department, Suffolk University](#)

December 9, 2008:

- Discussion of green jobs in North Carolina
 - [Paul J. Quinlan, Director, Economic Research and Development, North Carolina Sustainable Energy Association](#)

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ACTIONS TAKEN IN NORTH CAROLINA

The Commission was not acting in isolation in North Carolina. There were a number of prior actions that had already taken place related to climate change and a number of parallel processes currently underway that were looking at similar issues to those being discussed by the Commission. The Commission made efforts to utilize this information and to integrate these efforts.

The Clean Smokestacks Bill of 2002

In 2002, the General Assembly enacted the Clean Smokestacks Bill, officially titled the Air Quality/Electric Utilities Bill (SB 1078), which requires significant emissions reductions from coal-fired power plants in North Carolina. Under the Act, power plants must reduce their nitrogen oxide emissions by 77% in 2009 and sulfur dioxide emissions by 73% in 2013. The Act also directed DENR to study "issues related to the development and implementation of standards and plans to implement programs to control emissions of carbon dioxide from coal-fired generating units and other stationary sources of air pollution." (S.L. 2002-4, Sec. 13).

S.L. 2005-442(5)(3) directed the Commission to "consider and integrate the findings and recommendations" from this study as part of its investigation. The Commission looked at these issues as follows:

- On February 3, 2006, Mr. William G. Ross, Jr., Secretary of Environment and Natural Resources, reported on the ongoing efforts by DENR to control emissions of carbon dioxide and other greenhouse gases. Examples of these efforts include the North Carolina Clean Smokestacks Act (CSA), which established a plan and deadlines for significant reduction of sulfur dioxides, nitrogen oxides, and mercury. The Division of Air Quality (DAQ) within DENR also conducted a study on carbon dioxide emissions that evaluated the science of climate change and options for reducing greenhouse gas emissions. DENR extended their technical efforts by forming the Climate Action Plan Advisory Group (CAPAG), which was established to conduct a facilitated dialogue with a diverse group of parties who were interested in the subject of climate change. Secretary Ross highlighted the partnership between North Carolina and the military, which focused on sustainability of environmental, social, economic, and military on an ongoing basis and also the efforts by the Commonwealth of Pennsylvania to bring in a Spanish wind energy company and create jobs. Secretary Ross concluded by saying that DENR and DAQ wanted to provide the tools and the ability to analyze, on a cost benefit basis, the steps that our State might take to prepare for global climate change.
- Mr. Brock Nicholson, Deputy Director, Division of Air Quality, Department of Environment and Natural Resources, gave the final report on issues related to the development and implementation of standards and plans to implement programs to control emissions of carbon dioxide from coal-fired generating units and other stationary sources of air pollution. Mr. Nicholson focused his talk on recommendations from the final report on Carbon Dioxide Emissions Reduction Strategies for North Carolina. The recommendations from the report fall into three groups: (1) actions that are currently

underway and consist of eight listed plans of action; (2) group of regulations that may not require legislation and; (3) group of recommendations that requires some other direction by entities such as the Commission and the Legislature. Examples of these carbon dioxide reduction recommendations include getting the North Carolina State government to increase its leadership role and intensify efforts outlined in State Energy Plan and to develop a renewable portfolio standard. Mr. Nicholson said that the next steps are to establish the Climate Action Plan membership in groups, implementation of inventory details, and to work with this Commission to develop the climate action plan advisory group (CAPAG), report to this Commission, the General Assembly, and the Governor and to implement these recommendations. Mr. Nicholson also gave a report on specific activities and plans of DAQ, DENR, to develop and implement standards and plans to control emissions of carbon dioxide and other greenhouse gases.

- Issues related to the development and implementation of standards and plans to implement programs to control emissions of carbon dioxide from coal-fired generating units and other stationary sources of air pollution (S.L. 2002-4, Sec. 13); Report on specific activities and plans of the Division of Air Quality of the Department of Environment and Natural Resources to develop and implement standards and plans to control emissions of carbon dioxide and other greenhouse gases
 - [Brock M. Nicholson, Deputy Director, Division of Air Quality, DENR](#)

The CAPAG Process

One of the most significant outcomes of the Clean Smokestacks study discussed above was the creation of the Climate Action Plan Advisory Group, commonly referred to as CAPAG, by DENR. The CAPAG process was one of the largest and most comprehensive approaches taken by the State to evaluate climate change impacts on the State and possible mitigation options to consider. The CAPAG process was facilitated by the Center for Climate Strategies and evaluated both the environmental and economic implications of the many policy options it considered. The Commission heard reports on the CAPAG process and its findings at the following meetings: March 7, 2006; April 4, 2006; April 25, 2006; October 3, 2006; November 27, 2006; January 12, 2007; October 23, 2007; and January 16, 2008.

The CAPAG process culminated with the release of a final report entitled "Recommended Mitigation Options for Controlling Greenhouse Gas Emissions." The CAPAG final report is available online at: <http://www.ncclimatechange.us/capag.cfm>. The report included 56 recommended mitigation options for the State to consider, many of which have been implemented legislatively or by Executive Branch agencies. Appendix D of this report contains a table prepared by the Division of Air Quality of DENR that provides a status of the implementation of the various CAPAG mitigation options.

The following presentations received by the Commission highlighted the CAPAG process its findings:

March 7, 2006

- Update on activities of the Department of Environment and Natural Resources (DENR) and the Climate Action Plan Advisory Group (CAPAG)
 - [Brock M. Nicholson, Deputy Director, Division of Air Quality, DENR](#)

April 4, 2006:

- Update on activities of the Department of Environment and Natural Resources (DENR) and the Climate Action Plan Advisory Group
 - [B. Keith Overcash, Director, Division of Air Quality, DENR](#)

April 25, 2006:

- Update on activities of the Department of Environment and Natural Resources (DENR) and the Climate Action Plan Advisory Group (CAPAG)
 - [Brock M. Nicholson, Deputy Director, Division of Air Quality, DENR](#)

Dr. Karl Hausker, who works for Center for Climate Strategies (CCS), discussed the CAPAG process and discussed each mitigation option. Dr. Hausker explained that the CCS has a catalog of options that other states are either considering or implemented. Many options are presented to CAPAG, with initial information on the potential greenhouse gas emission reductions that may result, estimated a cost-per-ton for reducing emissions, and potential impacts on air quality, water quality, energy security, economic development, etc. This information helps CAPAG screen which options to focus on. A subset of 40 to 60 options are selected and work groups conduct a detailed examination on the options. The work groups develop recommendations and analytical support for the options. Finally, this information is presented to CAPAG for consideration and ultimate recommendation in their final report.

- Karl Hausker, Senior Advisor, Center for Climate Strategies, Harrisburg, Pennsylvania

October 3, 2006:

- Brock Nicholson, Deputy Director of the Division of Air Quality in the Department of Environment and Natural Resources, Mitch Peele, Tim Toben, George Everett, Michael Shore, Stephen Smith, and Tom Peterson presented an update on the activities of the Climate Action Plan Advisory Group (CAPAG). The CAPAG has adopted a rigorous approach to choosing strategies and low-hanging fruit for mitigation options for reducing greenhouse gases in North Carolina. After considering a wide range of options, they selected 52 to look further into and examine with a more intensive cost-benefit analysis. Options were selected according to the potential emission reductions compared to the cost of implementation. Some viable options currently on the table include an environmental portfolio strategy, which 22 states have implemented. Others include building codes to improve energy efficiency, combined heat and power systems, Integrated Gasification Combined Cycle (IGCC) plants, and tax credits for biofuels. In North Carolina's agriculture and forestry sectors, there are many opportunities for programs to both provide incentives to keep land in forests and agriculture and provide greenhouse gas offsets. These should be the areas that North Carolina has the most to gain from in mitigation scenarios.
- Update on and discussion of activities of the Climate Action Plan Advisory Group (CAPAG)

- Brock M. Nicholson, Deputy Director, Division of Air Quality, Department of Environment and Natural Resources
- Next Steps for the Climate Action Plan Advisory Group (CAPAG)
 - Tom Peterson, Executive Director, The Center for Climate Strategies

November 27, 2006:

- Update on activities of the Climate Action Plan Advisory Group (CAPAG) of the Department of Environment and Natural Resources (DENR) to develop and implement standards and plans to control emissions of carbon dioxide and other greenhouse gases
 - [Brock M. Nicholson, Deputy Director, Division of Air Quality, Department of Environment and Natural Resources](#)

January 12, 2007:

- Update on and discussion of activities and possible recommendations of the Climate Action Plan Advisory Group (CAPAG)
 - [Brock M. Nicholson, Deputy Director, Division of Air Quality, Department of Environment and Natural Resources](#)
 - [Tom Peterson, Executive Director, The Center for Climate Strategies](#)

October 23, 2007:

- Report on activities of the Department of Environment and Natural Resources (DENR) to develop and implement standards and plans to control emissions of carbon dioxide and other greenhouse gases:
 - Discussion of recommendations considered by the Climate Action Plan Advisory Group (CAPAG) at its meeting on 16 October 2007
 - [Brock M. Nicholson, Deputy Director, Division of Air Quality, Department of Environment and Natural Resources](#)
 - [Tom Peterson, Executive Director, Center for Climate Strategies](#)

January 16, 2008:

- Report on progress in consolidation of the recommendations of the Climate Action Plan Advisory Group (CAPAG)
 - Thomas D. Peterson, President and CEO, Center for Climate Strategies

Climate change-related actions taken by the General Assembly

Enacted Legislation:

Over the past five years, the General Assembly has considered and enacted a number of measures related to climate change, including the following:

- Energy Savings Contracts
 - S.L. 2006-190 (SB 402) -- Water/Utilities Savings in Govt. Facilities increased the aggregate total principal amount payable by the State on guaranteed energy savings contracts from \$50 to \$100 million and extended the maximum length of a financing contract from 12 to 20 years. This act also requires that when a State facility or State-assisted facility of 20,000 gross square feet or more replaces its heating, ventilation,

or air-conditioning equipment, it must conduct a life-cycle cost analysis of the replacement equipment if the equipment is financed with a guaranteed energy savings contract.

- S.L. 2009-375 (SB 304) -- Energy Savings Contracts' Cap/Program Administration removed the cap on the amount payable by the State for guaranteed energy savings contracts, and requires (1) qualified providers to contribute to the costs of administering the guaranteed energy savings contracts program, (2) life cycle cost analyses of energy conservation measures during investment grade audits conducted by qualified providers, and (3) local governmental units that enter into guaranteed energy savings contracts to report to the State Energy Office.
- State Motor Fleet Requirements
 - Part I of S.L. 2006-206 (SB 2051) – State Energy Use Planning/Energy Assistance directed the Department of Administration to develop a plan for the targeted conversion of fuel dispensing facilities to provide greater availability of biodiesel, ethanol, and other alternative fuels for State-owned fleets in order to attain the 20% requirement for the reduction or displacement of petroleum products consumed by State-vehicle fleets by January 2010.
 - S.L. 2009-241 (HB 1079) requires the Department Administration to give preference to new passenger motor vehicles that have fuel economy that is in the top 15% of that class of comparable automobiles for passenger motor vehicles purchased by the State.
- State-Owned Facilities
 - S.L. 2007-546 (HB 1075) [as codified by S.L. 2008-203] -- Energy Conservation in State Buildings promotes conservation of energy and water use in State, university, and community college buildings. This legislation requires new State, university, and community college buildings and major renovations of these buildings to be designed, constructed, and certified in accordance with specified energy and water efficient construction standards and prohibits the State from purchasing buildings that do not meet those standards at the time of construction or renovation.
- Promotion of Alternative Energy Resources and Technological Advancements
 - Part III of S.L. 2006-206 (SB 2051) – State Energy Use Planning/Energy Assistance established the North Carolina Biofuels Industry Strategic Plan Work Group in order to develop a strategic plan for expansion of biofuels as an industry in the State. The Work Group submitted its final report to the Environmental Review Commission in April 2007. The General Assembly appropriated \$4 million to the Biofuels Center of North Carolina in 2009.
 - S.L. 2007-397 (SB 3) -- Promote Renewable Energy/Baseload Generation. Perhaps the most relevant legislation involving green energy in North Carolina, S.L. 2007-397 established the Southeastern United States' first renewable energy and energy efficiency portfolio standard (REPS) in order to promote the development of renewable energy and energy efficiency in the State. This legislation requires electric power providers to use an increasing percentage of renewable energy resources and employ energy efficiency programs (12.5% by 2020) to meet the needs of the State's retail electricity customers. Requiring the use of solar energy, swine waste, and poultry waste resources with other available renewable energy resources (including hydropower, geothermal, and wind resources to name a few) will result in reduced

emissions of carbon dioxide, a greenhouse gas that significantly contributes to climate change.

- S.L. 2007-323 (Sec. 13.2, HB 1473) -- Establishment of the North Carolina Green Business Fund. The General Assembly established the NC Green Business Fund in Section 13.2 of S.L. 2007-323 (2007 Appropriations Act) to promote small businesses that develop and expand the biofuels industry, the green building industry, clean technology, and renewable energy products and businesses. Grants are made to private businesses of less than 100 employees, nonprofit organizations, local governments, and State agencies to encourage the expansion of small to medium sized businesses to grow a green economy in the State. The funds are to be used for the following purposes:
 - Maximize development, production, distribution, retail infrastructure, and consumer purchases of biofuels in the State, including the development of biofuels workforce.
 - Development of the green building industry in the State through the development and growth of a market for environmentally conscious, and energy efficient, green building processes.
 - Attract and leverage private-sector investments and entrepreneurial growth in environmentally conscious clean technology and renewable energy products and businesses, including the development of workforces in these industries.

The North Carolina Board of Science and Technology, a division of the Department of Commerce, developed selection criteria and published an open solicitation to accept grant proposals for the FY 2009 solicitation, and awards grants under this program. Maximum grants of \$100,000 will be awarded based on eligibility, funding availability, and other requirements. The General Assembly appropriated \$5 million to State Energy Office in 2009 towards this Fund.

- Section 4 of S.L. 2007-523 (SB 1465) -- Swine Farm Environmental Performance Standards established the Swine Farm Methane Capture Pilot Program administered by the Department of Environment and Natural Resources and the Utilities Commission. Under the Pilot Program, each electric power supplier that serves a swine farm that is selected to participate in the program must purchase all electricity generated by the swine farm using methane as fuel.
- S.L. 2009-390 (SB 1004 (=HB 1252)) – Amend Certain Electricity Generation Laws shortens the time within which the Utilities Commission must render a decision on a petition for a certificate of public convenience and necessity to 45 days from the filing of the petition, where the certificate is for the construction of a natural gas-fueled generating unit, the construction of which will result in the closure of all coal-fired units at the site, thus allowing compliance with reduced SO₂ emissions requirements. The legislation also authorizes the Utilities Commission to allow an electric public utility to recover operating costs and investment in a "carbon offset facility" through the savings in the fuel and fuel related costs realized by the utility, because it will not be operating or will reduce operation of carbon fuel facilities as a result of the construction or acquisition of the carbon offset facility. A "carbon offset facility" means an electric generating facility that generates electricity using solar electric, solar thermal, wind, hydropower, geothermal, or ocean current or wave

energy, and the electricity or equivalent BTUs produced will displace electric generation to the extent that greenhouse gases will be reduced.

- Financing Measures
 - Section 28.12 of S.L. 2008-107 -- Sales Tax Holiday for Certain Energy Star Rated Appliances created a sales tax holiday during the first weekend in November for the following energy star rated appliances: clothes washers; freezers and refrigerators; central air conditioners and room air conditioners; air-source heat pumps and geothermal heat pumps; ceiling fans; dehumidifiers; and programmable thermostats.
 - S.L. 2009-548 (HB 512) -- Incentives for Energy Conservation amends the State's incentives for alternative energy construction by adding equipment and machinery used for combined heat and power and geothermal equipment and fuel cell equipment that qualifies for a 35% credit equal to the cost to corporate or individual taxpayers who construct, purchase, or lease renewable energy property that is placed into service. This act also allows the credit to be taken against the gross premiums tax.
- Provision of Authority to Local Governments
 - S.L. 2009-95 (SB 52) -- Local Energy Efficiency Incentives provides that counties and municipalities, for the purpose of reducing the amount of energy consumption by new development, may adopt ordinances to grant a density bonus, make adjustments to otherwise applicable development requirements, or provide other incentives to a developer or builder within the county or municipality and its extraterritorial planning jurisdiction if the developer or builder agrees to construct new development or reconstruct existing development in a manner that the county or municipality determines, based on generally recognized standards established for such purposes, makes a significant contribution to the reduction of energy consumption. Generally recognized standards for reduction of energy consumption include: the Leadership in Energy and Environmental Design (LEED) program, the Green Globes program, or another nationally recognized certification program.
 - S.L. 2009-522 (HB 1389) -- Revolving Loan Fund for Energy Improvements authorizes cities and counties to establish loan programs to finance energy efficiency improvements and the installation of distributed renewable energy sources that are permanently affixed to real property. Qualifying renewable energy sources include: solar electric, solar thermal, wind, hydropower, geothermal, biomass, ocean current or wave energy, waste heat, and hydrogen resources.
 - S.L. 2009-525 (SB 97) -- Critical Infrastructure Assessment Changes aligns the purposes for which cities and counties may issue bonds payable from special assessments with the purposes for which project development financing may be used and adds the installation of distributed generation renewable energy sources or energy efficiency improvements that are permanently fixed to commercial, industrial, or other real property to those purposes for which assessment-based financing may be used.
 - S.L. 2009-527 (HB 148) -- Congestion Relief / Intermodal Transport Fund establishes a Congestion Relief and Intermodal Transportation 21st Century Fund to provide grants for: public transportation, railroads for intermodal and multimodal facilities and inland ports, State ports for terminal railroads and improved access to military facilities, and expansion of intercity passenger rail service. The law also provides transportation authorities the power, with voter approval, to levy a 1/2%

- local sales tax to be used only for public transportation systems. (Applies to Triangle Transit Authority for Wake, Durham, and Orange Counties and Piedmont Authority for Regional Transportation for Forsyth and Guilford Counties). Mecklenburg County already has such authority. The law provides the other 94 counties that operate a public transportation system or have a municipality in that county that operates a public transportation system the power, with voter approval, to adopt a ¼% local sales tax to be used only for public transportation systems. Lastly, the law authorizes increased taxes or provides regional or local taxing powers for transportation-related purposes.
- S.L. 2009-553 (H1387) -- Solar Collectors on Residential Properties makes the current prohibitions against ordinances and restrictive covenants that prohibit solar collectors on detached single family residences applicable to all residential property, except that the limitations on restrictive covenants do not apply to certain multi-story condominiums. It also clarifies that these statutes are applicable in historic districts. The law adds an exception for certain multi-story condominiums and allows restrictive covenants for residences where a homeowners' association is responsible for exterior maintenance to specify that the owner installing the solar collector is responsible for damage to the property and maintenance of the solar collector. The limitations on restrictive covenants are prospective only.

Legislation Pending in 2010 General Assembly:

In addition to the enacted legislation listed above, there are a number of other climate change-Related Legislation Pending the 2010 General Assembly, including the following:

- House Bill 28 -- LRC Study GHG Credits for Farming would provide that the Legislative Research Commission may study the feasibility and advisability of extending credits to the business of farming in the same manner that credits are extended to other businesses in the event North Carolina participates in a market based "Cap and Trade" program for greenhouse gas emissions adopted either by the federal government or by the State. (House Bill 28 is currently in the Committee on Rules, Calendar, and Operations of the House).
- House Bill 282 -- Green School Construction/Loan Fund would (i) promote energy efficiency in public school buildings and encourage public school participation in the Sustainable Energy-Efficient Buildings Program and (ii) create and appropriate funds to the Green School Construction Loan Fund. The bill provides that local boards of education and local school administrative units would be encouraged to voluntarily participate in the Sustainable Energy-Efficient Buildings Program. (House Bill 282 is currently in the House Appropriations Committee)
- House Bill 906 -- Alternative Fuels Tax Credits would create a tax credit for alternative fuel infrastructure and create a tax credit for alternative fuel vehicles and advanced technology vehicles. (House Bill 905 is currently in the House Finance Committee).
- House Bill 1050 -- Independent Energy Efficiency Administrator would create "NC SAVE\$ ENERGY" as an independent energy efficiency administrator in the State to administer energy efficiency and energy conservation programs and programs to promote the sustainable use of energy (House Bill 905 is currently in the House Energy and Energy Efficiency Committee).

- House Bill 1075 -- Teach 'Green Science' in High Schools would direct the State Board of Education to develop an elective high school science course on renewable and alternative energy. (House Bill 1075 is currently in the House Energy and Energy Efficiency Committee).
- House Bill 1127 -- Allow Greater Local Energy Efficiency Standards would allow for the adoption of more stringent building code provisions related to energy conservation by political subdivisions of the State. (House Bill 1127 is currently in the House Energy and Energy Efficiency Committee).
- House Bill 1199 -- Energy Efficiency in Buildings if State Funded would extend the standards governing energy efficiency and water use for major facility construction and renovation projects involving State, university, and community college buildings to major facility construction and renovation projects involving buildings of entities that receive funding in excess of a total of \$20,000 in State appropriations (House Bill 1199 is currently in the House Appropriations Committee).
- House Bill 1205 -- Establish North Carolina Commission on Climate Change would establish the North Carolina Commission on Climate Change. The Commission would consist of 15 members that are either legislators or appointees of the Governor. The Commission would study issues related to global climate change, including legal, economic, and technological issues, and make appropriate reports and recommendations. The bill would also establish a 20-member Advisory Council to assist the Commission as requested (House Bill 1205 is currently in the House Environment and Natural Resources Committee).
- House Bill 1207-- Clean Cars/Vehicle Retirement Program would improve air quality in the State by establishing a vehicle retirement program to provide incentives for removing older, more polluting vehicles from operation and to establish a consumer education program designed to improve vehicle fuel economy and reduce carbon dioxide emissions. (House Bill 1207 is currently in the House Environment and Natural Resources Committee).
- House Bill 1290 --NC Clean Cars Program would require the Environmental Management Commission to adopt rules to implement a low emission vehicle program that is functionally equivalent to California's program. The rules will apply to all motor vehicles beginning with the 2012 model year (House Bill 1290 is currently in the House Environment and Natural Resources Committee).
- House Bill 1440 -- Study Feed-in Rates would authorize the Joint Legislative Utility Review Committee and the Energy Policy Council to jointly study the feasibility and suitability of establishing feed-in rates to be paid to renewable energy electricity producers by electric power suppliers for each kilowatt-hour of electricity produced (House Bill 1440 is currently in the House Rules Committee).
- House Bill 1441 -- Greenhouse Gas Emissions Reduction Act would require (1) require the Department of Environment and Natural Resources to develop, maintain, and publish a greenhouse gas emissions inventory; (2) the State to reduce greenhouse gas emissions according to a certain schedule; (3) the Department of Environment and Natural Resources to develop a two step implementation plan to reduce greenhouse gas emissions statewide; and (4) monitoring and reporting to ensure implementation of the greenhouse gas emissions reduction plan according to the prescribed schedule. (House Bill 1441 is currently in the House Environment and Natural Resources Committee).

- House Bill 1443 -- Green Building Code would require new and renovated commercial and new residential buildings comply with energy conservation standards. (House Bill 1441 is currently in the House Energy and energy efficiency Committee).
- House Bill 1597 -- Income Tax Credit for Fuel-Efficient Vehicles would provide an income tax credit for the purchase price of fuel-efficient vehicles (House Bill 1597 is currently in the House Energy and energy efficiency Committee).
- Senate Bill 147 (=HB 504) -- Tax Credit for Energy-Efficient Homes would provide a tax credit to builders of energy-efficient homes. (Senate Bill 147 is currently in the Senate Finance Committee).
- Senate Bill 456 -- Expand Energy Star Sales Tax Holiday would expand the energy star qualified products that qualify for the sales and use tax holiday to include: battery chargers; dishwashers; room air cleaners; residential water heaters; boilers; ventilating fans; insulation; air sealing products; windows; doors; skylights; cordless phones; external power adapters; compact fluorescent light bulbs; decorative light strings; and residential light fixtures and provide a \$6,000 cap on the price per item. (Senate Bill 456 is currently in the Senate Finance Committee).
- Senate Bill 567 (=HB 1484) -- Promote Electricity Demand Reduction would promote the use of electricity demand reduction to satisfy renewable energy portfolio standards. (Senate bill 567 is currently in the House Energy and Energy Efficiency Committee).
- Senate Bill 688 (= HB 1290) – NC Low Emissions Vehicle Program would direct the Environmental Management Commission to adopt a low emission vehicle program that is the functional equivalent of California’s (Senate Bill 688 is currently in the Senate Commerce Committee).
- Senate Bill 1024 -- NC 2050 Sustainability Task Force would establish the North Carolina sustainability 2050 Task force to develop a North Carolina 2050 Sustainability Plan that plans for sustainable growth and development in North Carolina in the future through the year 2050. (Senate Bill 1024 is currently in the Senate Committee on Energy, Science, and Technology).
- Senate Bill 1044 (=HB 811) -- Moratorium on Coal-Fired Power Plants would provide economic relief to electric utility ratepayers during this period of economic recession and the coming recovery period by placing a moratorium on the construction of new coal fired power plants. . (Senate Bill 1024 is currently in the Senate Committee on Commerce.)
- Senate Bill 1068 -- Permitting of Wind Energy Facilities would create a parallel permitting process for proposed wind energy facilities in North Carolina. Permits for wind energy facilities proposed to be located in one of the twenty coastal or CAMA counties would be reviewed and acted upon by the Coastal Resources Commission. Permits for wind energy facilities proposed to be located outside the twenty CAMA counties would be reviewed and acted upon by the Environmental Management Commission. Permit applicants would be required to include a host of information pertaining to the proposed facility including studies on noise impacts and shadow flicker, impacts to viewsheds, and an explanation of how the facility would not result in significant impacts on ecological systems, natural resources, cultural sites, recreation areas, or historic sites of more than local significance, fish and wildlife, views from any State or national park, wilderness area, significant natural heritage area, or interference with air navigation routes, air traffic control areas, military training routes, or special use

airspace. Permit applicants would be required to provide the permitting entity with a plan to decommission and remove the wind energy facility that includes an estimate of the cost to decommission and remove the facility. The plan would also have to include a proposed description of the condition of the site once the facility has been decommissioned and removed. (Senate Bill 1068 is currently in the House Energy and Energy Efficiency Committee).

Other Legislative Bodies Looking at Related Issues:

- Legislative Study Commission on Urban Growth and Infrastructure Issues - Part 36 of S.L. 2008-181 (Studies Act of 2008) established the Legislative Study Commission on Urban Growth and Infrastructure Issues the purpose of which is to determine what measures the General Assembly may take to foster regional water resource and transportation planning, incentive based local land use planning, and more responsive and cost effective planning to accommodate rapid population growth in North Carolina's urban areas. The Commission is required to study the following issues:
 - Options for fostering regional planning for water and transportation infrastructure.
 - Strategies (including additional local land use regulatory tools) for encouraging the use of incentive based planning by urban area local governments.
 - Strategies to help urban communities maximize the benefits of growth and cope with the challenges presented by rapid growth in population, school enrollment, vehicle miles traveled on urban roads and highways, and related demands for other public services while preserving a viable economic climate and building greater regional cooperation.
 - Any other matters the Commission considers necessary in furtherance of the purpose for which it is established.

The Commission has met throughout the 2009-2010 legislative interim and expects to submit an interim report to the 2010 Regular Session of the General Assembly.

- Legislative Advisory Subcommittee on Offshore Energy Exploration - The Legislative Advisory Subcommittee on Offshore Energy Exploration has met 10 times since the Subcommittee was authorized by Speaker Hackney and President Pro-Temp Basnight in April 2009. In fulfilling its charge, the Subcommittee has studied the following regarding both traditional hydrocarbon and alternative energy development:
 - The implications of leasing federal waters off the coast of North Carolina
 - The relevant federal law and legal authority of the State with regard to offshore energy exploration
 - The potential impacts on the nation's energy supply, including best estimates for the availability of resources off the coast
 - The potential financial impact on the State's economy
 - The environmental impacts of exploration and associated infrastructure

The Subcommittee has completed its fact-finding and is currently preparing the final report to submit to the Legislative Research Commission on or before the convening of the 2010 Regular Session of the General Assembly in May.

- Section 9.12 -- University of North Carolina to Study Coastal Sounds Wind Energy (Modify Appropriations Act of 2007) required the University of North Carolina to

study the feasibility of establishing wind turbines in the Pamlico and Albemarle Sounds including an analysis of energy production potential (including the resulting benefits due to a reduction in dependence on fossil fuel combustion for generation of electricity), siting, ecological impacts, and statutory or regulatory barriers to construction and operation of one or more wind turbines and associated support and interconnection facilities in the coastal sounds. Section 9.14(a) of S.L. 2009-451 -- Coastal Demonstration Wind Turbines (2009 Appropriations Act) authorized the continuation of coastal wind study and appropriated \$300,000 to the University of North Carolina in order to contract for the design, permitting, procurement, construction, establishment, operation, and reclamation of up to three demonstration turbines and necessary support facilities in the sounds or off the coast of North Carolina.

- 2008 Studies Act (S.L. 2008-181):
 - Section 6.2 authorized the Environmental Review Commission, in consultation with the Division of Air Quality in DENR, to study the costs and benefits of the adoption of the California Motor Vehicle Emissions Standards in the State.
 - Section 6.2 authorized the Environmental Review Commission to study methods for implementing a State-level permitting system and siting requirements for commercial scale wind energy systems that will ensure that wind energy systems are sited in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources.
- 2009 Studies Act (S.L. 2009-574):
 - Section 6.6 authorized the Environmental Review Commission to study the feasibility and desirability of State government expanding its use of alternative sources of energy for fueling vehicles that are owned or leased by the State as well as for providing energy to power heating, ventilating, and air conditioning (HVAC) systems in buildings owned or leased by the State and to power other systems, motors, and appliances that are owned or leased by the State.
 - Section 6.7 authorized the Environmental Review Commission to study how North Carolina can grow and develop sustainably in the future through the year 2050. The Commission may consider what it means for the State's growth and development to be sustainable, focusing on the following areas: economic development, including transportation and water and sewer infrastructure; the State's natural resources, including its land, water, air, local food supply, and energy supplies; and quality of life issues, including health and education.
 - Section 6.8 authorized the Environmental Review Commission to study the possibility of establishing a Green School Construction Loan Fund to provide no interest loans to local school administrative units for green construction, with priority given to projects that will have the greatest impact on reducing the use of energy and water.

- Section 6.15 authorized the Environmental Review Commission to study the possibility of requiring new and renovated commercial buildings and new residential buildings to comply with energy conservation standards.
- Section 7.5 authorizes the Revenue Laws Study Committee and the Environmental Review Commission to study renewable energy tax credits and incentives for energy conservation.
- Section 8.3 authorized the Joint Legislative Utility Review Committee and the Energy Policy Council to jointly study the feasibility and suitability of establishing feed in rates to be paid to renewable energy electricity producers by electric power suppliers for each kilowatt hour of electricity produced.
- Section 8.6 authorized the Joint Legislative Utility Review Committee to study the creation of NC Saves Energy as an independent energy efficiency administrator for the State to administer energy efficiency and energy conservation programs and programs to promote the sustainable use of energy.
- Section 8.7 authorized the Joint Legislative Utility Review Committee to study the possibility of extending the standards governing energy efficiency and water use for major facility construction and renovation projects involving State, university, and community college buildings to major facility construction and renovation projects involving buildings of entities that receive state funding.

Senate Bill 3: The North Carolina Renewable Energy and Energy Efficiency Portfolio Standard (S.L. 2007-397)

Utilities Commission Study of Renewable Energy Portfolio Standards (REPs)

On October 3, 2006, James Kerr II, Commissioner of the North Carolina Utilities Commission, presented an update on the North Carolina Utilities Commission study on a Renewable Energy Portfolio Standard (REPS), which would mandate that a certain percentage of electricity come from renewable sources. The Renewable Portfolio Standards Advisory Group (RPSAG) was created to discern the impact of a REPS on electric rates as well as the impact on North Carolina's entire economy, including the potential for job creation and the offsetting of negative impacts on industrial rates. In addition to renewables, the Commission and the Advisory Group will examine methods for energy efficiency that will also lessen the reliance on traditional energy sources. The final report will be released for comment when the General Assembly convenes in January 2007.

- James Y. Kerr II, Commissioner, North Carolina Utilities Commission

Robert Gruber, Executive Director of the Public Staff for the North Carolina Utilities Commission, also presented a report on the proposal of the Public Staff of the North Carolina Utilities Commission to create a public benefits fund. An increased focus on Demand Side Management (DSM) programs and renewable energy in 2005 and 2006 led the Commission to hold several public hearings. During these hearings, participants commented that utilities have a disincentive to develop and implement DSM programs. Having an independent, non-utility third party administer the DSM programs, as occurs in Vermont and Wisconsin, prevents the need for

special rate treatments to address the problem of lost revenue. Ultimately, DSM programs require an effort both on the part of utilities to spend money on the programs, and on the part of the consumer to make changes in behavior.

- Robert Gruber, Executive Director, Public Staff, North Carolina Utilities Commission

January 12, 2007:

- Report on the study by the North Carolina Utilities Commission of a Renewable Energy Portfolio Standard (REPS) for the State of North Carolina and related issues
 - [James Y. Kerr II, Commissioner, North Carolina Utilities Commission](#)
 - [Sam Watson, Staff Attorney, North Carolina Utilities Commission](#)

S.L. 2007-397

On August 20, 2007, with the signing of Session Law 2007-397 (Senate Bill 3), North Carolina became the first state in the Southeast to adopt a Renewable Energy and Energy Efficiency Portfolio Standard (REPS). Under this new law, investor-owned utilities in North Carolina will be required to meet up to 12.5% of their energy needs through renewable energy resources or energy efficiency measures. Rural electric cooperatives and municipal electric suppliers are subject to a 10% REPS requirement.

Although the new law sets forth a number of details, these electric power suppliers generally may comply with the REPS requirement in a number of ways, including the use of renewable fuels in existing electric generating facilities, the generation of power at new renewable energy facilities, the purchase of power from renewable energy facilities, the purchase of renewable energy certificates, or the implementation of energy efficiency measures. Renewable energy facilities include facilities that generate electric power by the use of a renewable energy resource, combined heat and power systems, and solar thermal energy facilities. Renewable energy resource includes a solar electric, solar thermal, wind, hydropower, geothermal, or ocean current or wave energy resource; a biomass resource, including agricultural waste, animal waste, wood waste, spent pulping liquors, combustible residues, combustible liquids, combustible gases, energy crops, or landfill methane; waste heat derived from a renewable energy resource and used to produce electricity or useful, measurable thermal energy at a retail electric customer's facility; or hydrogen derived from a renewable energy resource.

October 23, 2007:

- Discussion of legislation enacted by the 2007 Regular Session of the General Assembly to provide for a renewable energy portfolio standard (REPS) for the State (Promote Renewable Energy/Baseload Generation, S.L. 2007-397 (Senate Bill 3))
 - [George F. Givens, Commission Counsel](#)
 - [Summary](#)
 - [Fiscal Note](#)

January 13, 2010:

- Report on the implementation of the North Carolina Renewable Energy and Energy Efficiency Portfolio Standards and subsequent proceedings (S.L. 2007-397; Senate Bill 3)
 - [Edward S. Finley, Jr., Chairman, North Carolina Utilities Commission](#)

- Docket No. E-100 Sub 113 -- Rulemaking Proceeding to Implement Session Law 2007-397

Other related proceedings before the Utilities Commission:

The Utilities Commission has also acted on a number of other items that should be considered in discussing actions taken by the state related to climate change, including the following:

- Docket No. E-100 Sub 126 -- IRP-Smart Grid Technology Plans
- Docket No. E-100 Sub 125 -- 2009 REPS Compliance Plans
- Docket No. E-100 Sub 124 -- Investigation of Integrated Resource Planning in NC 2009
- Docket No. E-100 Sub 123 -- Standards for Electric Utilities Relating to IRP, Rate Design Modifications to Promote Energy Efficiency Investments, Smart Grid Investments & Smart Grid Information Per Independence/Security Act 2007
- Docket No. E-100 Sub 121 -- Implementing a Tracking System for Renewable Energy Certificates Pursuant to Session Law 2007-397
- Docket No. E-100 Sub 120 -- Motion to Establish an Independently Administered Energy Efficiency Program in North Carolina to be Known as NC SAVES
- Docket No. E-100 Sub 119 -- 2008 REPS Compliance Plans
- Docket No. E-100 Sub 118 -- Investigation of Integrated Resource Planning in NC 2008
- Docket No. E-100 Sub 116 -- Investigation of Rate Structures, Policies and Measures that Promote a Mix of Generation and Demand Reduction for Electric Power Suppliers in North Carolina
- Docket No. E-100 Sub 115A -- Joint Reports to the Environmental Review Commission & the Joint Legislative Utility Review Committee on the Implementation of the Swine Farm Methane Capture Pilot Program
- Docket No. E-100 Sub 114 -- Investigation of Integrated Resource Planning in North Carolina - 2007
- Docket No. E-100 Sub 101 -- Joint Petition for Approval of "Model" Small Generation Interconnection Standards & Associated Application to Interconnect & Interconnection Contract Forms
- Docket No. E-100 Sub 90 -- Investigation of Voluntary Green and Public Benefit Fund Check-Off Programs
- Docket No. E-100 Sub 83 -- Investigation of Proposed Net Metering Rule.

In addition to these dockets, the investor-owned utilities in the state have filed a number of applications for approval of DSM/EE riders pursuant to S.L. 2007-397 and their IRP filings.

Section 14 of S.L. 2009-475 also directed the Utilities Commission to develop an online tracking of renewable energy certificates and to jointly study with the Energy Policy Council on the design of an online renewable energy certificates trading exchange to facilitate the establishment of a market for purchase and sale of renewable energy certificates.

Energy Policy Council

The Energy Policy Council was first established by the General Assembly in 1975 prompted by

the energy crisis the country was experiencing during that time. The Council is charged with overseeing the State's energy policies, including the State Energy Plan and the State Energy Emergency Plan, and providing recommendations for policy changes to the Governor and the General Assembly.

In 2009, the General Assembly reorganized the Energy Policy Council and the State Energy Office, moving the agency from the Department of Administration to the Department of Commerce, and making additional changes to the Council's membership and authority (S.L. 2009-446)..

The Council's membership includes two Senators appointed by the President Pro Tempore of the Senate, two members of the House of Representatives appointed by the Speaker of the House, and 12 public members appointed by the Governor from specific sectors of the State's energy economy, as required by statute. The current membership includes the following:

- Appointed by Senate President Pro Tempore Marc Basnight:
 - Sen. Ellie Kinnaird, D-Orange
 - Sen. Richard Stevens, R-Wake
- Appointed by House Speaker Joe Hackney:
 - Rep. Angela Bryant, D-Nash
 - Rep. Pricey Harrison, D-Guilford
- Electric power industry: George Everett, of Raleigh – Duke Energy
- Natural gas industry: George Baldwin, of Charlotte – Piedmont Natural Gas
- Energy policy matters: Jo Anne Sanford, Raleigh – Sanford Law Offices
- Alternative fuels and biofuels: Steven Burke, Oxford – Biofuels Center
- Energy efficient building design or construction: Tim Toben, Chapel Hill – Greenbridge Development (Chair of Council)
- Environmental protection: Michael Regan, Raleigh – Environmental Defense Fund
- Providing renewable energy services: Marcus Wilhelm, Chapel Hill – Solar Tech South
- Renewable sources of energy: Simon Rich, Edenton -- Fuqua Rich Weeks LLC
- County or city commissioner: Rodney W. Locks, – Brevard City Council
- Development of energy-related businesses: Henry McKoy, Durham – Fourth Sector Financial
- Low-income residential weatherization: Reginald Speight of Williamston – Martin County Community Action
- Petroleum industry: Kevin Garrison, of Concord- South Central Oil Company

On January 13, 2010, the Commission received a report from Tim Toben, Chair of the Energy Policy Council on the activities and objectives of the Council. The Council is proceeding on the assumption that there will be carbon constraints in developing its revised and updated State Energy Plan. The Council is developing a work to recommend affordable low carbon energy legislation to be considered by the General Assembly. Mr. Toben noted that private businesses are building these constraints into their future plans, much ahead of what government might be doing. Mr. Toben believes that energy efficiency will be a vital part of all future energy policies.

- Report on the activities and objectives of the Energy Policy Council
 - Tim Toben, Chair, North Carolina Energy Policy Council

Activities by the Department of Environment and Natural Resources

DENR Climate Change Initiative

The Department of Environment and Natural Resources has prioritized climate change as a key component in the department's 2009-2013 Strategic Plan. This DENR Climate Change Initiative will respond to climate change using both mitigation and adaptation strategies to reduce vulnerability, increase adaptive capacity, and improve resiliency of climate-sensitive resources. Many mitigation recommendations of the Climate Action Plan Advisory Group (CAPAG) are included, in addition to development of adaptation strategies to effectively address potential impacts to the state's natural and built environments.

DENR has established a Climate Change Steering Committee to provide oversight for implementation of DENR's Climate Change Initiative. This team is developing a focused approach to address climate change policy actions at state, regional and federal levels, while coordinating strategies with other state, federal and nongovernmental partners.

DENR's Climate Change Steering Committee has organized interagency working groups to focus on cross-cutting objectives: 1) Carbon Mitigation will address energy and carbon reduction activities, as well as issues related to green energy development; 2) Sea Level Rise Adaptation on oceanfront and estuarine shorelines; 3) Land Management will address climate-related issues in the interface between natural and built environments.

Discussion is underway about the need for North Carolina to develop a comprehensive state Climate Action Plan that addresses emission reduction and adaptation strategies. DENR is expected to be the lead agency on this effort, and will work closely with other departments to develop that plan.

January 13, 2010:

- Report on climate initiatives within the Department of Environment and Natural Resources; Update on the activities of the Interagency Leadership Team with regard to climate change
 - David W. Knight, Assistant Secretary for Natural Resources, DENR

N.C. Interagency Leadership Team

The North Carolina Interagency Leadership Team (ILT) was established in 2004 when five state agencies and five federal agencies committed to using a collaborative and interdisciplinary approach to developing a transportation system that involves all stakeholders and preserves the historic and natural resources, community values, and economic vitality of the state. The ILT has been working on climate change for several years, researching the science and projected impacts for North Carolina, and discussing how to plan for those impacts.

The "Planning for North Carolina's Future: Ask the Climate Question" Workshop on Climate Change Adaptation, which was held on March 2-3, 2010 in Raleigh, North Carolina, was the result of those efforts and was intended to be the foundation for a planning effort for the state's

climate change adaptation future. The workshop examined how North Carolina can reduce its risk while enhancing its resilience to the changes that are already occurring in the climate and which are projected to increase in the future.

Approximately 440 staff from federal, state, and local government agencies, as well as from universities and non-governmental organizations, attended the workshop. A summary report, along with videos of the presentations, is archived at www.climatechange.nc.gov.

- March 15, 2010
- Summary of the March 2010 Climate Change Adaptation Workshop sponsored by the North Carolina Interagency Leadership Team and next steps
- David W. Knight, Assistant Secretary for Natural Resources, DENR

Environmental Management Commission

Renewable Energy Committee
Biomass report
Anti-Idling rules

Building Code Council

The North Carolina State Building Code Council adopts and amends the State Building Code, as authorized by G.S. 143-138. The Commissioner of Insurance has general supervision over the administration and enforcement of the State Building Code, and the Engineering Division of the Office of the State Fire Marshall of the Department of Insurance staff and assist the Building Code Council in its work. The Council meets quarterly to consider proposed amendments to the code and to conduct public hearings on proposals. Proposed changes to the building code are considered a rule under the State Administrative Procedures Act (Chapter 150B of the General Statutes) and must proceed through the rule making process, including possible legislative review of proposed changes to the Code.

Effective July 1, 2006, the base document for the 2006 North Carolina Energy Conservation Code is the 2003 IECC. On March 11, 2008, the 2009 North Carolina Energy Conservation Code was adopted. Based on the 2006 IECC (and referencing ASHRAE 90.1-2004 for commercial buildings), the code includes strengthening amendments to the base code, requiring fenestration U-factor and SHGC values of 0.40 across the state. Builders were allowed to use the previous code until June 30, 2009.

The Council is currently in the process of updating the Code, with an anticipated effective date of January 1, 2012. While the 2009 IECC will be used as the base code, the state was awarded a \$500,000 federal grant to improve its next code's stringency by 30% and improve compliance through comprehensive training and enforcement.

The University of North Carolina System

The UNC Board of Governors adopted a policy in October 2009 that the University shall develop a plan to become carbon neutral as soon as practicable and by 2050 at the latest, with an ultimate goal of climate neutrality. The same policy directs that the University shall develop and implement a comprehensive, multimodal transportation plan designed to reduce carbon emissions and dependency on single occupant vehicles.

The University of North Carolina at Chapel Hill

In 2007, UNC-CH became a charter signatory of the American College and University Presidents' Climate Commitment, pledging the University to climate neutrality by midcentury.

- An Energy Efficient Lighting Policy was implemented and incandescent bulbs were phased out on campus by January 2008.
- In 2008, the University completed its first comprehensive greenhouse gas emissions inventory. In 2008, the University was responsible for emitting 569,195 metric tons of carbon dioxide—the equivalent of burning 3,263 railcars of coal at a traditional power plant. The largest sources were the University's onsite heat and power plant (more than 60 percent) and purchased electricity (more than 35 percent).
- Overall greenhouse gas emissions have increased 37 percent, and emissions per full time equivalent student by 19 percent, during rapid campus expansion since 2000.
- UNC-Chapel Hill has reduced its energy use per square foot of building area by 8% since 2003. On a per square foot basis, carbon emissions have dropped 12 percent.

In order to achieve climate neutrality by 2050, UNC evaluated the most cost-effective options to reduce emissions. The first campus Climate Action Plan, completed in fall 2009, outlines the most promising opportunities over the short-, medium-, and long-term. An interim goal is to reduce greenhouse gas emissions to year 2000 levels by 2020. Seventeen strategies have been identified to halve emissions at low or moderate cost. They include efficiency improvements in new and existing buildings, the introduction of heat recovery chillers, and behavioral changes.

In 2010 Chancellor Thorp appointed an Energy Task Force to identify and evaluate opportunities for reducing carbon emissions more rapidly.

UNC has received a grant of \$17.5 million for a Solar Energy Research Center, and is collaborating with NCSU, Research Triangle Institute and other institutions in the Research Triangle Energy Consortium (RTEC) to develop the potential of North Carolina to become a National Solar Energy research and innovation hub.

Other activities underway in the State

Cliffside Debate

In May 2005, Duke Energy submitted an application to the North Carolina Utilities Commission seeking a certificate of public convenience and necessity to construct two new 800 MW coal-fired generating units at its Cliffside Steam Generating facility in Rutherford County. On March 21, 2007, the Commission issued an order under Docket No. E-7, Sub 790 granting a certificate of public convenience and necessity with conditions to Duke Energy allowing the construction of one 800 MW unit, subject to certain conditions. These conditions included the following:

1. Duke must retire the existing Cliffside Units 1 through 4 (approximately 200 MW) no later than commercial operation of the new 800 MW unit.
2. Duke shall commit to invest, on an annual basis, 1% of its annual retail revenues in energy efficiency and DSM programs, and shall also retire other coal-fired generating units on a MW for MW basis to account for actual load reduction realized from the new energy efficiency and demand-side management programs, subject to certain constraints.

In addition to the Utility Commission's actions on Cliffside, the activities of the Division of Air Quality of DENR with regard to the issuance of an air quality permit for the Cliffside facility are worth noting. *Although carbon emissions are not yet regulated, and the law does not require such a plan, the permit, issued in 2008, requires implementation of a CO2 mitigation plan that will require Duke Energy Carolinas to make the newly installed capacity at the Cliffside facility carbon neutral by 2018.* The elements of this plan include:

1. The previously mentioned shutdown of Cliffside Units 1-4.
2. Construction of Unit 6 in a manner that will accommodate the installation and operation of future carbon control technologies.
3. The additional shutdown of several of Duke's older coal-fired generating plants throughout the State, with a total capacity equal to the capacity of Cliffside Unit 6 (800-megawatts) by 2018.

Once completed, the retirement of these units and units 1-4 is projected to offset CO2 emissions from Unit 6 by approximately 4.6 million tons per year. An added benefit of closure of the additional 800-megawatts of older, less efficient coal-fired plants will be substantial additional reductions in pollutants in other locations in North Carolina by 2018.

Progress Energy's plans to retire coal-fired generating units in North Carolina

January 13, 2010:

- Report on Progress Energy's plans to retire eleven coal-fired electric generating units in North Carolina by 2017
- Caroline Choi, Director - Energy Policy & Strategy, Progress Energy

ACTIONS TAKEN BY OTHER STATES, BY THE FEDERAL GOVERNMENT, AND BY INTERNATIONAL BODIES

S.L. 2005-442 (5)(1)(b) directed the Commission to conduct a "review of actions taken by the federal government and by other states to address global warming." The Commission evaluated these activities as follows:

Actions taken by state and local governments

February 3, 2006:

- Ms Judith Greenwald, Director of Innovative Solutions, Pew Center on Global Climate Change, Alexandria, Virginia, presented a report on actions taken by other states and local governmental units in the United States to address global climate change. Specifically, she discussed actions being taken in New York, California, Pennsylvania, and in the Southwest. Ms Greenwald said that most states are involved in some sort of regional initiative on either climate change or clean energy: 28 states have climate action plans, a number of states have greenhouse gas reporting, 22 states and the District of Columbia have renewable portfolio standards, 27 states have incentives and mandates for promoting ethanol, a lot of states have worked together to track renewable energy credits across state lines, and 10 states have formally adopted the California greenhouse gas standards. Ms Greenwald also asserted that North Carolina state emissions were significant with electricity and transportation sectors are the biggest emitters.
- (Pertains to Section 5(1) b of the Authorizing Legislation)
- - [Judith M. Greenwald, Director of Innovative Solutions, Pew Center on Global Climate Change](#)

November 27, 2006:

- Franz Litz, the Climate Change Policy Coordinator in the New York State Department of Environmental Conservation, presented on the development of the Regional Greenhouse Gas Initiative (RGGI) in the Northeast. Mr. Litz emphasized the use of research and regionally relevant studies in order to better understand how climate change will affect each state and its constituents specifically. RGGI is the first mandatory cap and trade program for carbon dioxide and power plants. In a cap and trade program, the total emissions from a defined source are determined and a cap on emissions is established. Permits are issued per ton up to the limit of the cap, and each source of the pollutant has an emissions and allowance account. The source can reduce its emissions through actual emissions reductions or by buying permits to cover the emissions, whichever option costs less. RGGI's target for the emissions reductions in the first five years is to cap emissions at current levels and then to reduce emissions by 10 percent over the next four years. This program also incorporates offsets, where emissions sources are allowed to purchase certified reductions outside of the covered sectors. The credits from these purchases can

be used interchangeably with the allowances/permits. The five initial types of offsets permitted in RGGI include: natural gas, propane or heating oil efficiency; converting land to forest and proving a reduction; capturing gas from landfills and using in combustion; methane capture from animal operations, an offset to benefit the electricity sector. New offsets are allowed in the program in order to reduce the price pressure of the program. The offset program encourages regional and often in-state investment. As a region, the Northeast offers great potential to make reversing climate change a real issue and to make meaningful strides, more so than if it was a single state initiative. RGGI is continually trying to work with other states and other markets, such as California, as they have found that linking states together leads to a more cost effective program.

- [Franz T. Litz, Climate Change Policy Coordinator, New York State Department of Environmental Conservation](#)

October 3, 2006

- Report on actions taken or under consideration by other states to address global climate change
 - Joshua Bushinsky, State Solutions Fellow from the Pew Center on Global Climate Change, presented a report on actions taken or under consideration by other states to address global climate change. He summarized the variety of reasons for which states are taking action on climate change, including concerns about changes in weather patterns causing droughts, intense and frequent storms, and negative impacts on economic development. States are also pursuing the positive effects on economic development that can be achieved by getting ahead of the regulatory curve. There are currently twelve states with targets for reducing greenhouse gas emissions. Those include the states involved in Regional Greenhouse Gas Initiative, California, and Arizona. Twenty-two states as well as the District of Columbia have renewable portfolio standards, and ten states over the past six months have adopted either standards or incentives for renewable fuels. States set targets for reduction according to what is achievable, using strategies that have been adopted elsewhere, using current and available technologies, and remaining in line with what scientists believe is necessary to avoid dangerous climatic
 - [Emission Targets](#)
 - [Update on State and Regional Action on Climate Change](#)

October 23, 2007:

- Report on actions taken by other governmental units in the nation related to global climate change during the past year
 - [Patrick Hogan, Solutions Fellow, Pew Center on Global Climate Change](#)

January 16, 2008:

- Emissions reduction goals and standards in the state of Maryland
 - [George S. "Tad" Aburn Jr., Director, Air and Radiation Management Administration, Maryland Department of the Environment](#)
- Adaptation to the effects of climate change in the state of Maryland
 - [Kenneth A. Colburn, Senior Consultant, Center for Climate Strategies](#)

- [Bill Dougherty, Senior Scientist, Center for Climate Strategies](#)

January 13, 2009:

- Presentation of the report "New Climate World: Integrating State and Regional Programs into an Emerging Federal System for Greenhouse Gas Regulation"
 - [Robert B. McKinstry, Senior Advisor, Center for Climate Strategies](#)
- Presentation of "Greenhouse Gas (GHG) Emission Reductions Between California GHG Standards and Federal Corporate Average Fuel Economy (CAFE) Standards" (S.L. 2008-181, Sec. 6.2)
 - [Janice L. Godfrey, Environmental Engineer, Division of Air Quality, DENR](#)

November 17, 2009:

- Report on recent actions taken by state and local governments to address climate change
 - [Thomas Peterson, President, Center for Climate Strategies](#)

National actions

December 4, 2007:

- Update on federal activities related to global climate change
 - Timothy Profeta, Director, Nicholas Institute for Environmental Policy Solutions, Duke University

December 9, 2008:

- Brief discussion on anticipated federal actions on energy and climate change
 - Timothy H. Profeta, Director, Nicholas Institute for Environmental Policy Solutions, Duke University

November 17, 2009:

- Report on recent federal actions related to climate change
 - Victor Flatt, Tom & Elizabeth Taft Distinguished Professor of Environmental Law, School of Law, University of North Carolina Chapel Hill

International actions

January 16, 2008:

- Summary of the "Synthesis Report from Climate Change 2007" prepared by the Intergovernmental Panel on Climate Change (IPCC)
 - Dolores M. "Dee" Eggers, Commission member and Associate Professor, Department of Environmental Studies, University of North Carolina at Asheville

February 11, 2008:

- Presentation on the state of the science on global climate change, what developing countries are doing to address climate change in relation to what the United States and other

industrialized countries are doing and should do in this regard, and what the State of North Carolina should do with regard to climate change

- Dr. Rajendra Pachauri, Chair, Intergovernmental Panel on Climate Change, and Director General, The Energy and Resources Institute

January 13, 2010:

- Update on federal and international actions related to climate change, including the activities and outcomes of the 15th Conference of the Parties to the United Nations Framework Convention on Climate Change in Copenhagen, Denmark
 - Victor Flatt, Tom & Elizabeth Taft Distinguished Professor of Environmental Law , School of Law, University of North Carolina Chapel Hill

DISCUSSION OF POSSIBLE POLICY OPTIONS

The Commission spent a considerable amount of time examining possible policy options that may play a role in helping the State mitigate greenhouse gas emissions, as well as technologies and policies that would help the state adapt and better manage the climate change impacts on the State.

Mitigation Options:

April 25, 2006:

Dr. David Green, Corporate Fellow from the Oak Ridge National Laboratory in Knoxville, Tennessee discussed the transportation sector. The transportation sector is second to industry in greenhouse gas emissions and the largest carbon dioxide emitter. He argued that by using a mix of policy and economic measures, regulatory, and other measures that greenhouse gas emissions from the United States transportation sector could be reduced by 20 to 25 percent by 2015 and by as much as half by 2030. Dr. Green discussed, in detail, many of the potential policy and economic measures including moving people to mass transit, increasing fuel economy via technology and policy, and using alternative fuels. He also addressed how state policies differ from national policies.

- David L. Greene, Corporate Fellow, Oak Ridge National Laboratory, Knoxville, Tennessee

Dr. Edward Rubin is from the Center for Energy and Environmental Studies in the Department of Engineering and Public Policy at Carnegie-Mellon University. Dr. Rubin discussed greenhouse gas reductions from the electric power sector, options that are available to reduce power sector emissions of greenhouse gases, and some key policy considerations. He pointed out that power plants are a large source of carbon dioxide and that coal-fired power plants are major national and local considerations. Some of the potential options available for reducing carbon dioxide emissions in the power sector include: reducing demand; improving efficiencies in technologies used for power generation, transmission, and distribution; utilizing power generation technologies that use no or low carbon; and employing technologies that might be able to both capture and store or sequester carbon dioxide. Dr. Rubin also discussed regulatory policies that would help limit greenhouse gas emissions.

- Edward S. Rubin, Director, Center for Energy and Environmental Studies, Department of Engineering and Public Policy, Carnegie Mellon University, Pittsburgh, Pennsylvania

Dr. Marilyn Brown, Interim Director of the Engineering Science and Technology Division of Oak Ridge National Laboratory in Oak Ridge, Tennessee discussed opportunities to reduce greenhouse gas emissions from the built environment. She first asserted that residential, commercial, and industrial buildings account for 43 percent of United State's carbon dioxide emissions. Some of her suggestions for reducing greenhouse gas emissions from the built environment include: improving efficiency, installing electric chromic windows and

unconventional water heaters, and preserving land in farm and forest use, to name a few. Dr. Brown discussed the Energy Policy Act, which was put in place because of policies needed to stimulate investments. She claimed that the Energy Policy Act was not sufficient to meet challenges; in particular one flaw is that it does not have mandatory regulations. She promoted Leadership in Energy and Environmental Design (LEED) certification, energy efficiency resource standards, and smart growth. In the long term, Dr. Brown was optimistic for zero energy buildings. She asserted that greenhouse gas emissions in the building sector could be decreased to today's levels by 2025 if all of the technological opportunities are totaled and the policies investigated in the Pew report are itemized. This would amount to a 10 percent overall reduction in the nation's greenhouse gas emissions in 2025.

- Marilyn A. Brown, Interim Director, Engineering Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee
- Forestry and agriculture sector

Dr. Dennis W. Hazel, a Professor in the Forestry and Environmental Outreach Program at North Carolina State University, discussed the range of opportunities represented by the forestry and agricultural sectors to address climate change. Forestry is the second largest industry in North Carolina and a 29 billion dollar per year economic additive. Dr. Hazel discussed four ways that forestry and agriculture can contribute solutions to the global climate change issue including reducing carbon dioxide, methane, and nitrous oxide emissions; promoting carbon sequestration perhaps by increasing land area; improving the productivity of the land in order to improve carbon sequestration; and substituting farm and forest biomaterials for others. He also provided a list of possible action items including: protecting farmland from permanent conversions; improving feed efficiency; increased use of residential and urban trees; and dedicated crops for ethanol. Dr. Hazel pointed out many economic opportunities for North Carolina, such as the biomass industry and waste salvage.

- Dennis W. Hazel, Professor, Forestry and Environmental Outreach Program, North Carolina State University, Raleigh, North Carolina

October 23, 2007

- Technical Working Group Updates and Discussion:
 - Agriculture, Forestry, and Waste
 - Mitchell A. "Mitch" Peele
 - Energy Supply
 - Tim Toben and George T. Everett
 - Residential, Commercial, and Industrial
 - Michael Shore
 - Transportation and Land Use
 - Michael Shore
 - Cross-Cutting Issues
 - Stephen A. Smith
- Next Steps for the Climate Action Plan Advisory Group (CAPAG)
 - Tom Peterson, Executive Director, The Center for Climate Strategies

November 27, 2006:

Discussion of the options for production and use of biofuels in North Carolina:

- Kurt Creamer, the Biomass Program Manager at North Carolina Solar Center and Animal and Poultry and Waste Management Center at North Carolina State University, gave a presentation on the options for production and use of biofuels in North Carolina. Biofuels offer many potential benefits to North Carolina including reducing tail pipe emissions and greenhouse gas emissions, generating jobs at fuel production plants, and increasing energy security. The most promising energy crops, either currently grown in North Carolina, existing naturally, or easily implemented in growing cycles include: canola for biodiesel; switchgrass for ethanol to be used in coal firing, combustion and gasification to generate electricity; hulless barley for starch based ethanol plants; coastal bermudagrass, which is already planted in spray fields for its tremendous nutrient uptake potential; and woody biomass because of the expanse of forest in North Carolina. One product with much potential but little scientific research as of yet, is the use of microalgae as a biofuel, though preliminary studies have shown that it produces up to 5,000 to 15,000 gallons of biofuel per year.
- The most commonly used type of biofuel is ethanol, which can be produced from sugar crops, including sugar cane, sugar beets, or sweet sorghum, or from corn. In the United States, ethanol is primarily produced from corn. In 2006 up to 20 percent of the nation's corn crop went into ethanol production. Ethanol use in North Carolina is at about 5 million gallons per year, and though there are currently no ethanol production plants in the State, three have been proposed. Biodiesel is produced by a chemical reaction between methanol and a source of oil and fat such as canola oil, soybeans, peanuts, cotton seed, and rendering operations that provide animal fats. Hog waste and poultry litter also present opportunities to capture methane and eliminate the greenhouse gas source and generate electricity. The energy balance of biofuels, the amount of energy inherent in the fuel divided by the amount of energy required to produce it, is best for cellulosic ethanol such as sugarcane, sugar beet, and switchgrass.
- Moving ahead with these findings, the Biomass Council is working to create a road map for the State in terms of biomass for power production and biofuel production. Funding to promote biofuels across the State can be found in several federal programs that promote the use of renewable energy and several State tax credit programs specifically for the production and distribution of biofuels. However, farmers face a great risk in undertaking this type of project and are not willing to pay the up front costs of conducting feasibility studies. These costs are not accounted for in federal or state programs and present a real barrier to more widespread implementation of biofuel crops and production.
 - Kurt S. Creamer, P.E., Biomass Program Manager, North Carolina Solar Center and Animal and Poultry Waste Management Center, North Carolina State University

December 11, 2006:

- Discussion of the Chicago Climate Exchange's greenhouse gas emission registry and reduction and trading system for greenhouse gases, including a discussion of the benefits to North Carolina agriculture of methane capture offsets at animal operations
- Dr. Michael Walsh, the Senior Vice President of the Chicago Climate Exchange (CCX), presented on the Exchange's greenhouse gas emission registry and reduction and trading

system, and the potential benefits to North Carolina. The CCX is one of two cap and trade emissions markets in the world, the other being the European Union. The CCX includes about 250 million metric tons of carbon dioxide equivalent emissions in their cap and trade system. It is a voluntary program with no regulatory authority. Members sign a contract and are legally committed to emissions reductions schedules which are created during the negotiations process. The exchange has about 225 members including industries, universities, farmers, governments, smaller business, and non-governmental organizations (NGOs). The exchange began with a four year commitment to cut emissions by 1 percent per year, in order to get to 4 percent below the baseline by 2006. The baseline in this case is the average of the emissions included during the years 1998 through 2001. All members of CCX have to include their major emitting activities in the U.S., with entity wide participation. Members must also quantify emissions and conduct an audit, in order to establish a baseline. Then they are given a batch of tradable permits and extra tradable allowances, which can be banked and used in later years. If a member does not meet their budgeted amount of emissions reductions, they have to buy credits from another member, perhaps one with an extra cut from an offset project. All members are audited each spring. The CCX is a fully integrated and electronic environmental audit and trading system. The first concept in selecting offsets is to bring in reductions from low-cost sectors and to provide economic development opportunities to those areas that need to be built out. The CCX has an open door policy for anyone willing to be audited and make the commitment.

- Michael J. Walsh, Senior Vice President, Chicago Climate Exchange
- Thomas R. Casten, founder and chair of the Alliance for Clean Technology and founder and former Chief Executive Officer of Trigen Energy and Primary Energy Ventures, led a discussion on combined heat and power as a method for reducing greenhouse gas emissions and increasing energy efficiency. The Alliance for Clean Technology is a coalition of local power developers, World Wildlife Fund, Greenpeace, the Sierra Club, the Suzuki Foundation, and other environmental groups, union workers concerned about the loss of jobs, and gas and electric distribution utilities. The mission of the Alliance is to promote clean technology policies to reduce greenhouse gas emissions, to boost the economy, and to buy time for new technologies to improve. Clean technology options which hold great promise include energy recycling, for example combined heat and power. Capturing the exhaust heat from power generation or industrial waste that industries normally throw away, has the potential to generate 20 percent of the United States' electricity.
- Combined heat and power systems are not more widely used in the United States because industries interested in implementing them face regulatory barriers and interconnection costs and are denied payment for benefits that can be provided such as cleaner technology. This is primarily because the energy generation system has not been updated in several decades. In the United States, 38 percent of carbon emissions come from electricity generation, whose efficiency peaked 45 years ago. With the system as it is now, electricity received by the end user represents one third of the fuel used to generate it. Combined heat and power plants increase efficiency by up to 50 percent, as they are located on-site and the fuel used to make power results in thermal heat which can be used

and distributed. Local generation reduces the need for a central grid and power does not travel long distances which lowers the quantity of electricity lost through power lines. Local generation also stabilizes voltages and reduces vulnerability to extreme weather and terrorism.

- In terms of the cost, the up front costs for building local plants are greater than for central generation, however connecting to a grid requires payments for generation and distribution. Denmark pushes for local generation, and with 52 percent of their power generated locally, they are approaching 60 percent efficiency. Other countries that have already implemented combined heat and power, at around 20 percent of their total electric generation, include Portugal, China, Japan, Poland and Germany. In order to encourage implementation of combined heat and power and energy recycling, distribution utilities should be required to interconnect those who qualify as clean technology and include the costs in their base rate, as they provide a public benefit. Regulation should also be changed to address utility bias towards central generation. And finally, there should be incentives for industries to recycle energy, as there are risks involved in the initial phases of implementation. About half of the states in the U.S. have eliminated these barriers, and some states, such as Connecticut, New York, and California are moving towards eliminating standby and interconnection charges.
 - Thomas R. Casten, Founder and Chair, Alliance for Clean Technology and founder and former Chief Executive Officer of Trigen Energy and Primary Energy Ventures
- Raymond DuBose, the Director of the Energy Services Department at the University of North Carolina at Chapel Hill gave a presentation on the award-winning energy facilities located on the University campus. The campus facility is composed of a combined heat and power facility (CHP) which simultaneously generates steam and electricity and distributes thermal and electrical energy throughout the system – a central chilled water system – and central plants and underground systems for the production and distribution of steam. These campus facilities generate a third of the power used on campus, and the remaining two thirds are purchased from Duke Energy. The thermal efficiency of the UNC Chapel Hill CHP facility – 70 percent – is twice that of the average U.S. power plant. Some of the innovations of the facility include: using the steam to run a turbine and a generator which meets a third of the peak campus demand; the high pressure steam from the boilers is used for the heating and cooling of all buildings on campus and the hot water in residence halls, the hospital and research labs; use circulating fluid out of bed combustion (CFB) to burn coal which reduces the release of nitrous oxides and sulfur dioxide; and central chilled water plants, cooled at night when energy prices are low, which use steam to generate chilled water for all campus air conditioning needs.
 - Raymond E. DuBose, Director, Energy Services Department, University of North Carolina at Chapel Hill

January 12, 2007:

- Proposed recommendations for inclusion in the Interim Report from members of the Commission
 - Stanley R. Riggs, James H. Stephenson, and Walter Clark

- Dolores "Dee" Eggers
- Timothy Profeta
- Michael Shore

December 4, 2007:

- Discussion of the extent to which carbon offsets may be reliably identified and quantified
 - William L. Chameides, Dean, Nicholas School of the Environment, Duke University
- Discussion of opportunities for, and recommendations related to, carbon offset projects in the agriculture and forestry sectors
 - William C. McDow III, Southern Forest Projects Manager, Environmental Defense
- Presentation and consideration of the recommendations of the Agriculture, Forestry, and Waste Technical Working Group of the Climate Action Plan Advisory Group (CAPAG)
 - Brock M. Nicholson, Deputy Director, Division of Air Quality, Department of Environment and Natural Resources (DENR)
 - Thomas D. Peterson, President and CEO, Center for Climate Strategies
 - Stephen Roe, Senior Scientist, E.H. Pechan and Associates and Facilitator Agriculture, Forestry, and Waste Management Technical Work Group and Lead Consultant for Emissions Inventory, Center for Climate Strategies
 - Dennis W. Hazel, Assistant Professor and Extension Specialist, Department of Forestry and Environmental Resources, NCSU
 - Christopher B. Hopkins, Outreach Associate, Department of Forestry and Environmental Resources NCSU
 - M. Paul Sherman, Director of Air Quality and Energy Programs, North Carolina Farm Bureau Federation
 - Robert W. Slocum, Jr., Executive Vice President North Carolina Forestry Association

March 5, 2008:

- Presentation of the Recommended Mitigation Options of the Climate Action Plan Advisory Group (CAPAG) (Consolidated format)
 - Thomas D. Peterson, President and CEO, Center for Climate Strategies

April 22, 2008:

- Presentation of the results of the Intergovernmental Panel on Climate Change in the context of creating a greenhouse gas emissions reduction goal for the State of North Carolina
 - Robert B. Jackson, Faculty Director, Center on Global Change, and Professor of Biology and Environmental Sciences, Duke University
- Presentation on electricity technologies in a carbon-constrained world
 - Bryan Hannegan, Vice President of Environment and Generation, Electric Power Research Institute

November 14, 2008:

- Discussion of four key action areas related to climate change (energy efficiency, clean energy, pollution capture, and long-range planning), discussed in the publication “Cornerstones,” issued by the Southern Alliance for Clean Energy
 - John D. Wilson, Research Director, Southern Alliance for Clean Energy

December 9, 2008:

- Discussion of green buildings and green building codes
 - R. Christopher Mathis, President, MC2 Mathis Consulting Company

January 13, 2009:

- Discussion of whether to set a goal to reduce State greenhouse gas emissions
- Discussion of whether to establish energy efficiency standards for buildings constructed with State funds
- Discussion of whether and how to amend the State Building Code in order increase the energy efficiency of buildings constructed or substantially renovated in the State
- Discussion of recycled energy and combined heat and power recommendations
 - Stephen A. Smith, Executive Director, Southern Alliance for Clean Energy

Adaptation options:

March 5, 2008:

- Presentation of options for State and local governments to consider with regard to plans for and adaptation to the impacts of global climate change
 - William E. Holman, Visiting Senior Fellow, Duke University Nicholas Institute for Environment Policy Solutions
- Presentation of the "North Carolina Green Cities Plan" by the Centers for Environmental and Climatic Interaction
 - Mack B. Pearsall, Advisory Board Member, Centers for Environmental and Climatic Interaction

December 9, 2008:

- Discussion of adaptation strategies for rural and conservation lands and waters
 - Sam H. Pearsall, Southeast Regional Manager for Land, Water, and Wildlife, Environmental Defense Fund

January 13, 2009:

- Discussion of adaptation recommendations
 - James H. Stephenson, Policy Director, North Carolina Coastal Federation

Future role and purpose of legislative commission on climate change

January 13, 2009:

- Discussion of whether to establish a permanent global climate change commission and Global Climate Change Advisory Council
 - Dr. Dolores M. Eggers, Assistant Professor, University of North Carolina at Asheville
 - Michael S. Regan, Policy Manager, Environmental Defense Fund

OTHER ELEMENTS OF THE COMMISSION CHARGE

Greenhouse Gas Reduction Goal:

Subsection (2) of S.L. 2005-442 authorized the Commission "to develop a recommended global warming pollutant reduction goal for the State" if the Commission, in the course of its examination "determines that it would be appropriate and desirable for the State to establish a global warming pollutant reduction goal."

The Commission discussed the appropriateness and desirability of setting a pollutant reduction goal at the following meetings:

April 22, 2008:

- Presentation of the results of the Intergovernmental Panel on Climate Change in the context of creating a greenhouse gas emissions reduction goal for the State of North Carolina
 - Robert B. Jackson, Faculty Director, Center on Global Change, and Professor of Biology and Environmental Sciences, Duke University

January 13, 2009:

- Commission discussion of whether to set a goal to reduce State greenhouse gas emissions

The Commission also heard presentations on regional approaches to establishing greenhouse gas emissions reduction goals at the following meetings:

November 27, 2006:

- Discussion of the Northeast Regional Greenhouse Gas Initiative (RGGI)
 - Franz T. Litz, Climate Change Policy Coordinator, New York State Department of Environmental Conservation

January 13, 2009:

- Presentation of the report "New Climate World: Integrating State and Regional Programs into an Emerging Federal System for Greenhouse Gas Regulation"
 - Robert B. McKinstry, Senior Advisor, Center for Climate Strategies

Organization and participation in a regional climate change forum in the Southeast:

Section 6 of S.L. 2005-442 authorized the Commission to "work cooperatively with other state and national governments to organize a forum on global climate change, including its causes, impacts, challenges, and opportunities in the southeastern United States. The Commission may also work

cooperatively with other State agencies with respect to the agencies' areas of responsibilities regarding greenhouse gas emissions and climate change."

The Commission was not directly involved in the organization of a forum on global climate change in the southeast, but actively solicited information on activities taking place in other states in the Southeast and mid-Atlantic region, as follows:

January 16, 2008:

- Emissions reduction goals and standards in the state of Maryland
 - George S. "Tad" Aburn Jr., Director, Air and Radiation Management Administration, Maryland Department of the Environment
- Adaptation to the effects of climate change in the state of Maryland
 - Kenneth A. Colburn, Senior Consultant, Center for Climate Strategies
 - Bill Dougherty, Senior Scientist, Center for Climate Strategies

November 14, 2008:

- Overview of various reports on climate change issued by the National Conference of State Legislators
 - Glen Andersen, Program Principal, National Conference of State Legislators, Environment, Energy, and Transportation Program

November 17, 2009:

- Summary of "Southern Regional Economic Assessment of Climate Policy Options and Review of Economic Studies of Climate Policy" completed for the Southern Governor's Association
 - Thomas Peterson, President, Center for Climate Strategies

In February 2008, the Commission held its business meeting as part of the Emerging Issues Forum entitled: "North Carolina's Energy Futures." The members of the Commission also took part in a number of additional conferences and proceedings related to climate change in the Southeast.

FINDINGS

Findings of Commission adopted by resolution:

On February 11, 2008, the Commission met as part of the Emerging Issues Forum entitled "North Carolina's Energy Futures." One of the invited speakers at the Commission was Dr. Rajendra Pachauri, Nobel Prize Winner and former Chairman of the Intergovernmental Panel on Climate Change. Following Dr. Pachauri's presentation, the Commission adopted a resolution acknowledging the following findings:

- 1. Climate change is real.**
- 2. Human activity is a factor in that change.**
- 3. The Commission should move forward to address the issues faced by the State.**

Endorsement of Findings by the U.S. Global Change Research Program:

The Commission generally endorses the findings contained in the U.S. Global Change Research Program's 2009 publication "*Global Climate Change Impacts in the United States*," as follows:²

Key findings:³

- 1. Global warming is unequivocal and primarily human-induced.**
 - a. Global temperature has increased over the past 50 years. This observed increase is due primarily to human-induced emissions of heat-trapping gases.
- 2. Climate changes are underway in the United States and are projected to grow.**
 - a. Climate-related changes are already observed in the United States and its coastal waters. These include increases in heavy downpours, rising temperature and sea level, retreating glaciers, thawing permafrost, lengthening growing seasons, lengthening ice-free seasons in the ocean and on lakes and rivers, earlier snowmelt, and alterations in river flows.
 - b. These changes are projected to grow.
- 3. Widespread climate-related impacts are occurring now and are expected to increase.**
 - a. Climate changes are already affecting water, energy, transportation, agriculture, ecosystems, and health.

² Global Climate Change Impacts in the United States. Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson, (eds.). Cambridge University Press, 2009. Online: www.globalchange.gov/usimpacts.

³ Id at 13.

- b. These impacts are different from region to region and will grow under projected climate change.
- 4. Climate change will stress water resources.**
 - a. Water is an issue in every region, but the nature of the potential impacts varies.
 - b. Floods and water quality problems are likely to be amplified by climate change in most regions.
- 5. Crop and livestock production will be increasingly challenged.**
 - a. Agriculture is considered one of the sectors most adaptable to changes in climate. However, increased heat, pests, water stress, diseases, and weather extremes will pose adaptation challenges for crop and livestock production.
- 6. Coastal areas are at increasing risk from sea-level rise and storm surge.**
 - a. Sea-level rise and storm surge place many U.S. coastal areas at increasing risk of erosion and flooding, especially along the Atlantic and Gulf Coasts, Pacific Islands, and parts of Alaska.
 - b. Energy and transportation infrastructure and other property in coastal areas are very likely to be adversely affected.
- 7. Threats to human health will increase.**
 - a. Health impacts of climate change are related to heat stress, waterborne diseases, poor air quality, extreme weather events, and diseases transmitted by insects and rodents.
 - b. Robust public health infrastructure can reduce the potential for negative impacts.
- 8. Climate change will interact with many social and environmental stresses.**
 - a. Climate change will combine with pollution, population growth, overuse of resources, urbanization, and other social, economic, and environmental stresses to create larger impacts than from any of these factors alone.
- 9. Thresholds will be crossed, leading to large changes in climate and ecosystems.**
 - a. There are a variety of thresholds in the climate system and ecosystems. These thresholds determine, for example, the presence of sea ice and permafrost, and the survival of species, from fish to insect pests, with implications for society. With further climate change, the crossing of additional thresholds is expected.
- 10. Future climate change and its impacts depend on choices made today.**
 - a. The amount and rate of future climate change depend primarily on current and future human-caused emissions of heat-trapping gases and airborne particles.
 - b. Responses involve reducing emissions to limit future warming, and adapting to the changes that are unavoidable.

Findings specific to the Southeast region:⁴

11. Projected increases in air and water temperatures will cause heat-related stresses for people, plants, and animals.

- a. Effects of increased heat include more heat-related illness; declines in forest growth and agricultural crop production due to the combined effects of heat stress and declining soil moisture; declines in cattle production; increased buckling of pavement and railways; and reduced oxygen levels in streams and lakes, leading to fish kills and declines in aquatic species diversity.

12. Decreased water availability is very likely to affect the region's economy as well as its natural systems.

- a. Increasing temperatures and longer periods between rainfall events coupled with increased demand for water will result in decreased water availability.

13. Sea-level rise and the likely increase in hurricane intensity and associated storm surge will be among the most serious consequences of climate change.

- a. Low-lying areas, including some communities, will be inundated more frequently – some permanently – by the advancing sea. Current buildings and infrastructure were not designed to withstand the intensity of the projected storm surge, which would cause catastrophic damage.
- b. If sea-level rise increases at an accelerated rate (dependent upon ice sheet response to warming) a large portion of the Southeast coastal zone could be threatened.

14. Ecological thresholds are likely to be crossed throughout the region, causing major disruptions to ecosystems and to the benefits they provide to people.

15. Quality of life will be affected by increasing heat stress, water scarcity, severe weather events, and reduced availability of insurance for at-risk properties.

Findings submitted by Commission Members:⁵

General Findings:

1. Within the scientific community, there exists a level of consensus on climate change indicating that it presents a threat to the future economic health of North Carolina, the physical well-being of its residents, and its natural resources.
2. Failing to act and ignoring impending climate change will result in significant impacts to the State's environment, economy, infrastructure, and society.

⁴ Id. at 111-116.

⁵ Based on comments submitted by Commission members following the March 15, 2010 meeting of the Commission. Original comments at: [March 15, 2010 Comments on Report and Recommendations](#).

3. According to Dr. Pachauri, leaders need to start reducing carbon emissions by 2015 at the latest.
4. North Carolina has been a national leader in energy conservation and environmental stewardship, including the areas of energy efficiency requirements and investments, renewable energy investments, and natural resource conservation, but more can be done. Significant opportunities remain to reduce greenhouse gas emissions statewide, especially from major contributors of greenhouse gas emissions, including electricity production, transportation, building construction and operation, and the residential and consumer sectors.
5. Full adoption and implementation of the CAPAG recommendations was estimated to reduce gross greenhouse gas emissions by approximately 47% from 256 million metric tons of CO₂e in the reference case forecast to 137 million metric tons of CO₂e by 2020, or within 1 percent of 1990 levels.
6. Most of the LCGCC recommendations adopted in 2007 and many of the CAPAG recommendations have been implemented at some level, and the framework for implementing others is in place.
7. The General Assembly is justified in taking further action aimed at reducing greenhouse gas emissions, increasing sequestration to sinks, promoting economic opportunities afforded by climate change, and preparing to adapt to the effects of climate change.
8. Actions to reduce greenhouse gas emissions will reduce North Carolina's reliance on foreign sources of energy, lead to the development of technology, attract new businesses to North Carolina, and increase energy efficiency throughout the State, resulting in benefits to the economy and to individual businesses and residents.
9. In devising measures to achieve reduction of greenhouse gas emissions, North Carolina must strive to not disadvantage North Carolina businesses as compared to businesses in other states.
10. Policies pursued and actions taken by North Carolina will, in concert with complementary policies and actions by other states and the federal government, substantially reduce the global levels of greenhouse gas emissions and the impacts of those emissions as well as directly benefit the State and local governments, businesses, and the State's citizens.
11. The State should take advantage of the enormous level of expertise in the public and private sectors in the State in developing plans to address climate change.
12. Climate change and its impacts occur over long time scales, so the State should address climate change in its long-term planning programs.

13. According to the Stern Review of the Economics of Climate Change, every dollar invested in addressing greenhouse gas emissions will save five dollars.⁶

North Carolina's contribution to greenhouse gas emissions:

14. Greenhouse gas emissions in the State in 1990 were approximately 54 million tons of carbon dioxide equivalent (CO₂e), and are expected to increase to about 98 Million metric tons by 2020, or by approximately 83 percent on a consumption basis.
15. North Carolina's annual CO₂ emissions are increasing faster than those of any other state except Arizona.
16. North Carolina ranks 24th in the world for GHG emissions if one regards each state in the U.S. as if it were a country, and then compares all states and countries.

Impacts to North Carolina:

17. Climate model forecasts suggest an increase in temperature locally to range from 4.5° F under a lower emissions scenario to 9° F under a higher emissions scenario over the next century. The rising temperatures will affect energy use, public health, recreation, and even the types of plants that grow in the State.
18. Increased temperatures are expected to worsen air quality. Two pollutants of chief concern are ozone and fine particulate matter, both of which can enter the lungs and cause health problems.
19. The North Carolina Coastal Resources Commission's Science Panel on Coastal Hazards predicted that by 2100, North Carolina will experience sea level rise of 0.4 – 1.4 meters (15 – 55 inches) with a likely rise of 1 meter (39 inches). The Panel recommends "that a rise of 1 meter (39 inches) be adopted as the amount of anticipated rise by 2100, for policy development and planning purposes."
20. With 301 miles of coastline and 3,375 miles of tidal shoreline, North Carolina is vulnerable to the threat posed by sea level rise, which would have detrimental and costly effects, including significant inundation, erosion, flooding, property damage, and increased storm surge.
21. Climate change will put additional strain on both the quality and quantity of already stressed water resources.

Adaptation:

22. The State must seek to better understand and adapt to climate change impacts in order to protect the integrity of the State's natural resources and maximize the economic

⁶ *The Economics of Climate Change. The Stern Review.* By Nicholas Stern. Pp. 692. (Cambridge University Press, Cambridge, 2007.) Online at: http://www.hm-treasury.gov.uk/stern_review_report.htm.

utilization of these resources without jeopardizing the long-term character of these resources.

- 23. Many State and federal policies are not coordinated, resulting in reduced effectiveness.
- 24. Improved data and monitoring, particularly at the local level, will help policy makers.
- 25. The State should act proactively to adapt.

Electricity and Power Generation:

- 26. Combustion of coal is one of the predominant contributors of carbon dioxide to the atmosphere.
- 27. Coal is the most carbon intensive fuel and the dominant source of North Carolina's electricity, comprising approximately (59%) of all electricity generated in the State in 1990, and is projected to produce as much as 54% of the electricity generated in the State in 2020.
- 28. Coal combustion has a 67 percent energy waste factor, delivering only approximately 33 percent electricity.
- 29. Integrated gasification combined cycle (IGCC) has limited potential in North Carolina due to limited options for carbon storage in the State.
- 30. North Carolina imports virtually all of its energy, exporting from the State economy over \$12 billion per year for petroleum, natural gas, coal, and nuclear material.
- 31. Nuclear power may be an important option for the State to consider as a possible power generation alternative, based on its reliable generation, reduced emissions of traditional air pollutants, and minimal emissions of greenhouse gases.

Energy efficiency, conservation, and renewable energy:

- 32. In 2007, the General Assembly enacted Senate Bill 3 (S.L. 2007-397) the first Renewable Energy and Energy Efficiency Portfolio Standard (REPS) in the Southeastern United States, in order to promote the development of renewable energy and energy efficiency in the State. Under the Act, electric power providers in the State must use an increasing percentage of renewable energy resources and employ energy efficiency programs to meet a minimum of twelve and one half percent (12.5%) of the needs of the State's retail electricity customers by 2021.
- 33. According to reports generated for the Utilities Commission, North Carolina can achieve a 14% reduction in electricity consumption at no cost and meet a 10% renewable energy portfolio standard by 2017 at no increased cost in utility rates.

34. North Carolina ranked 46th in the nation on energy efficiency spending per capita in 2003.
35. Energy efficiency represents the least-cost opportunity to generate additional electricity cost-effectively, with little or no additional greenhouse gas emissions.
36. Changes in the guiding language for electric utilities in the State may result in increased investments in renewable energy, energy efficiency, and conservation.
37. States that invest in market transformation and technology development programs have enhanced job growth and economic development; a focus on energy efficiency and renewable energy would provide additional benefits to the public such as energy cost savings and reduced greenhouse gas emissions.
38. According to the American Council for an Energy-Efficient Economy (ACEEE), North Carolina stands to gain 38,000 net jobs in 2025 compared to the reference case forecast by making significant investments in energy efficiency technologies and practices. These activities would also save consumers a net \$3.6 billion cumulative in lower energy and water bills.
39. The rate paid to non-utility generators for electricity generated by combined heat and power is often less than market price and does not reflect the true value of electricity. Some states have established market-based rates for electricity that make combined heat and power more attractive to non-utility generators.
40. The utility purchase price for electricity from renewable sources is low in comparison to other states where generation is expanding rapidly.
41. The sign-up process for net-metering remains burdensome.
42. Interconnection requirements vary for facilities that are located in municipal and cooperative utility service territories, and interconnection standards require redundant electrical controls that are not included in national model codes. The costs of these redundant electrical controls can eliminate the cost-effectiveness of smaller projects.
43. According to the State Energy Office, energy efficiency and conservation programs will result in a net increase in jobs in North Carolina, and cost less per kWh saved (\$0.03) than construction of new power plants that would otherwise have to be build to meet increased demand (\$0.07).
44. North Carolina has significant undeveloped alternative energy potential from solar thermal, solar photovoltaic, natural gas from anaerobic decomposition of organic material, and wind.
45. In its report entitled "Evaluation of the Natural Resource Impacts of the Woody Biomass Industry in North Carolina" the Environmental Management Commission found that

without “proper protections,” the use of woody biomass for energy can have significant impacts in the areas of “land use..., soil nutrient deterioration, water quality degradation, destruction of wildlife habitat, ecosystem disruption, air quality and ash deposition.” The report includes the following findings:

- a. The use of woody biomass for energy production has a broad range of potential impacts.
- b. The differing interpretations of the statutory definition of “renewable energy resource” as applicable to biomass results in uncertainty and confusion.
- c. There are currently no standards or guidelines that require the sustainable management of the utilization of woody biomass.
- d. Current funding sources for forestry and landowner incentive programs may be inadequate.
- e. State policy on woody biomass utilization for electricity production should apply equally to utilization of woody biomass for biofuels production.
- f. Current data collection is inadequate to inform state policy makers and regulators.
- g. Oversight of the impacts of the woody biomass market is currently spread across a number of State entities and agencies.

Buildings Codes and Building Practices:

46. Buildings account for over 40 percent of electricity used in the State.
47. North Carolina's residential sector consumed 715,851 billion Btus of energy in 2007. The commercial sector consumed 573,467 billion Btus in the same year.
48. Investments in energy saving technology and other green building techniques will result in lower lifecycle building costs than conventional building construction and operating practices.
49. A 30 percent improvement in U.S. building efficiency would reduce energy bills by \$75 million in 15 years and eliminate the need for 80 new nuclear power plants over the next 20 years.
50. If enacted, North Carolina House Bill 1344, “Green Building Code,” would require commercial and residential buildings in North Carolina to meet the latest edition of the standards in the International Code Council’s International Energy Conservation Code (IECC).
51. North Carolina has already enacted legislation to require energy and water efficiency improvements in new and retrofitted state buildings, but there is room to go further. For example, a recent analysis identified ten no-cost or low-cost energy efficiency investments that could cut North Carolina Central University’s energy costs by 65%, saving the university \$13 million over five years. These investments would avoid the emission of 27,000 tons of carbon dioxide per year.

52. Over 50 percent of state spending on electricity is accounted for by the UNC system. These public universities face a major financial hurdle limiting their ability to invest in energy efficiency. Current law requires that all utility cost savings be returned to the State's General Fund at the end of each fiscal year. This requirement creates a disincentive for the universities to invest in conservation and efficiency. House Bill 695, introduced last year, would allow universities in the UNC system to keep savings generated from efficiency improvements for reinvestment in additional energy and water saving measures.

Carbon markets and carbon regulation:

53. Uncertainty in the price of carbon and possible carbon regulation has made it difficult for public and private entities to develop action plans to address climate change.
54. Clarity and certainty in the price of carbon at the federal and international level will provide stability in carbon markets and promote development, investment, and innovation.
55. Cap and trade regulation of greenhouse gas emissions is most effective when implemented on a federal level.
56. In the international community there is general acceptance of cap and trade for carbon regulation, and in the private sector there is already significant activity as greenhouse gas emitters seek arrangements for long-term access to carbon offset markets.

Carbon sequestration and carbon offsets:

57. North Carolina farmers may have significant economic opportunities to participate in carbon markets by offering carbon sequestration services or emissions offsets.
58. North Carolina is losing land forestlands and agricultural lands. Between 1990 and 2002, one million acres of forestry land were lost to non-forest use. Farm acreage also decreased by more than 2 percent from 2000 to 2004. Some policies to address climate change may help these sectors retain land.
59. North Carolina farmers may have significant economic opportunity for carbon sequestration and soil improvement through bio-char; however, additional research is needed to better understand this opportunity.
60. North Carolina businesses and local governments may have significant economic opportunity (e.g., through profit or fuel price stabilization) for biodiesel production from micro-algae, however, additional research is needed to better understand this opportunity.

Animal Waste Management:

61. Manure management activities are the largest contributor to the State's agricultural greenhouse gas emissions, contributing approximately 50 percent.
62. Primary emissions from manure management are methane (CH₄), which is 19 times more potent than carbon dioxide, and nitrous oxide (N₂O), which is 281 times more potent than carbon dioxide.
63. Swine producers can generate income by capturing methane emissions and using them to produce energy, using anaerobic digestion technology. There is also an emerging market for carbon offsets, emissions reductions achieved in industries unlikely to be regulated by climate policy. Nationally, agricultural and landfill methane capture projects represent the largest supply of carbon offsets and the greatest number of projects.

Transportation and Land Use:

64. The transportation sector consumed 27 percent of total energy used in the State and accounted for one-third of total energy-related CO₂ emissions in 2000.
65. Annual vehicle miles traveled, and related greenhouse gas emissions, are increasing at a rate faster than the population due to low-density, uncoordinated land use.
66. Local planners often identify road building as the most powerful factor predicting the location and density of future growth. Currently, DOT long-range planning directly extrapolates existing growth patterns, which are urban sprawl patterns, with little or no public transportation or consideration of increasing pedestrian and bicycle accessibility. As a result, DOT constructs and expands roads based on plans that support and promote increased urban sprawl.

Public Awareness and Education:

67. In a public attitudes survey conducted by the Division of Coastal Management of DENR in 2009, 75 percent of all respondents believe that sea level rise is occurring in North Carolina, but only 38 percent of the respondents believe they will be affected. 66 percent of the respondents believe the State should be taking steps now to plan and prepare for sea level rise.
68. The State's museums, aquariums, zoos, and other facilities are providing information on the impacts of climate change on the State, but more public information and outreach is still needed.
69. There is a shortage of trained professionals to implement energy efficiency and renewable energy projects in the State; and the general education and awareness of the public and business leaders is inadequate to participate effectively in projects to increase energy efficiency.

PREVIOUSLY APPROVED RECOMMENDATIONS

At its February 22, 2007 meeting, the Legislative Commission on Global Climate Change (Commission) adopted the following proposals for inclusion as recommendations in the Commission's Interim Report.

1. CAPAG Residential Commercial and Industrial Mitigation Option 2 (RCI-2): Expand Energy Efficiency Funds.
2. CAPAG Residential Commercial and Industrial Mitigation Option 3 (RCI-3): Energy Efficiency Requirements for Government Buildings, with the addition of reasonable language from Commission member Bob Slocum, North Carolina Forestry Association, who supplied the following two options on 27 February 2007: "Adherence to energy related guidelines in LEED+ or Green Globes standards." OR "For the purposes of determining LEED certification, credit may be awarded for the use of wood-based materials derived from all credible sources, including the Sustainable Forestry Initiative Program, the Canadian Standards Association, the American Tree Farm System and other credible certified sources programs."
3. CAPAG Residential Commercial and Industrial Mitigation Option 4 (RCI-4): Market Transformation and Technology Development Programs.
4. CAPAG Residential Commercial and Industrial Mitigation Option 5 (RCI-5): Improved Appliance and Equipment Efficiency Standards.
5. CAPAG Residential Commercial and Industrial Mitigation Option 6 (RCI-6): Building Energy Codes.
6. CAPAG Residential Commercial and Industrial Mitigation Option 7 (RCI-7): "Beyond Code" Building Design Incentives and Targets, Incorporating Local Building Materials and Advanced Construction.
7. CAPAG Residential Commercial and Industrial Mitigation Option 8 (RCI-8): Education (Consumer, Primary/Secondary, Post-Secondary/Specialist, College and University Programs).
8. CAPAG Residential Commercial and Industrial Mitigation Option 11 (RCI-11) Residential, Commercial, and Industrial Energy and Emissions Technical Assistance and Recommended Measure Implementation.
9. Energy Supply Mitigation Options 3 and 9 (ES-3 and ES-9): Removing Barriers and Providing Incentives to Combined Heat and Power (CHP) and Clean Distributed Generation (DG). Commission Counsel will send a letter to the North Carolina Utilities Commission (NCUC) on behalf of the LCGCC to request that the NCUC study issues

related to interconnection that are barriers to the development of CHP systems. In particular, the LCGCC will request that the NCUC open a docket for the purpose of establishing an interconnection standard for the power interval between 100 kilowatts and the FERC standard (2 megawatts or 20 megawatts, needs clarification).

10. CAPAG Cross Cutting Issues Mitigation Options 1, 2, and 3 (CC-1, CC-2, and CC-3): Greenhouse Gas Inventories and Forecasts (I&F), State Greenhouse Gas Reporting, and State Greenhouse Gas Registry, with inclusion of "possible consequences" in Mitigation Option CC-1 as recommended by Commission member Dr. Stan Riggs.
11. CAPAG Cross Cutting Issues Mitigation Option 4 (CC-4): State Climate Public Education and Outreach.
12. CAPAG Cross Cutting Issues Mitigation Option 5 (CC-5): State Climate Change Adaptation Strategy, with the inclusion of the following three additions:
 - a. Include the State Hazard Mitigation Planning Group (Dr. Boyles).
 - b. Address major storm/critical events (Dr. Riggs).
 - c. Address coastal hazards disclosure (Rep. Harrison).
13. CAPAG Cross Cutting Issues Mitigation Option 6 (CC-6): Options for State Greenhouse Gas Goals or Targets. The Commission will establish a State greenhouse gas emissions goal when the Commission resumes meeting after the 2007 Session of the General Assembly adjourns.
14. The Commission endorses concept of a Renewable Energy Portfolio Standard (REPS) (similar to that described in ES-2) without setting a specific target percentage.
15. Management of Hog Manure proposal made by Commission member Tim Profeta (NC Commission Member Additional Option 8), as modified on motion of Commission member Dr. Riggs that subsidies be provided for lagoon conversion to achieve greenhouse gas reductions. Mr. Profeta provided draft legislation on this proposal.
16. The Commission recommends that legislation be enacted to change net metering regulations to allow more use as proposed by Commission member Dr. Dee Eggers (NC Commission Member Additional Option No. 17). Dr. Eggers provided draft legislation on this proposal.
17. The following statement will be included in the report of the Commission on motion of Commission member Stephen Smith: "The Commission acknowledges that substantial greenhouse gas reductions can be achieved in the transportation sector. The Commission will continue to study ways to achieve these reductions."

RECOMMENDATIONS FOR FUTURE CONSIDERATION

The General Assembly, through a new permanent Commission or through other existing oversight bodies, should consider the following policy alternatives to potentially mitigate climate change impacts, adapt to the changing climate, and seek to provide long-term benefits to the economy and citizens of North Carolina:

Adaptation:

1. Develop a comprehensive Climate Change Adaptation Plan (CCAP) that includes the following elements:
 - a. Designation of a single lead agency to coordinate efforts, but includes the full involvement and cooperation by all other State agencies.
 - b. Developed in close coordination with State and federal agencies, commissions, local governments, non-profit organizations, and universities
 - c. Provides opportunities for public involvement.
 - d. Inventories existing federal, State, local programs, and plans that address adaptation to climate change.
 - e. Develops and adopts climate adaptation goals and principles.
 - f. Identifies policy recommendations that will protect the long-term environmental and economic health of the State, and set priorities for adaptation that will minimize adverse impacts of climate change.
 - g. Identifies methods to better coordinate and integrate State natural hazard planning and regulatory programs.
 - h. Conducts an economic analysis to determine the potential costs and benefits of a “status quo” alternative and of implementing recommendations proposed in the CCAP.
 - i. Prioritizes recommendations in the plan based on the certainty of impact, and minimization of adverse impacts to citizens, ecosystems, and local economies.
 - j. Focuses on adaptation needs resulting from sea level rise, as well as changes in rainfall and temperature that could alter traditional industries such as agricultural, forestry, and fishing.
 - k. Should consider impacts to water quantity and water quality.
 - l. Should evaluate the sufficiency of current funding resources related to adaptation and mitigation.
 - m. Consider whether to establish a NC Hazard mitigation fund.
 - n. Pursue federal funding of southeast regional adaptation study.
 - o. Should provide significant opportunities for public outreach and education, including the following:
 - i. Providing maps of sea level rise estimates to local governments, realtors, conservation organization, and the public via NC One Map.
 - ii. DENR and the University system should jointly develop a framework for a publicly available database to make economically and environmentally

prudent adaptation decisions (mapping, surveys, inventory, and monitoring stations within the NC coastal zone).

- p. Study possible policy approaches, including, but not limited to:
 - i. Consider the findings and recommendations that resulted from the Beach Management Summit, held in March 2009 in Beaufort, North Carolina hosted by the North Carolina Coastal Federation and the UNC Center for the Study of Natural Hazards and Disasters.
 - ii. Increase protection of coastal wetlands and their ability to migrate inland by directing the CRC to prohibit new bulkheads and hard structures in "critical wetland protection areas" or "areas of environmental concern."
 - iii. Consider utilizing the consistency provisions of CAMA and federal Coastal Zone Management Act to help resolve conflicts between existing policies and programs.
 - iv. Require DCM to report annually on the loss of coastal wetlands due to estuarine shoreline hardening and other uses.
 - v. Require applicants for permits to harden the estuarine shoreline outside of areas of environmental concern to mitigate their impacts on wetlands.
 - vi. Direct local governments in the coastal plain to develop plans considering how they will adapt to potential changes in tax revenue based on projected increases in sea level over the next century.
 - vii. Authorize the use of coastal management grants to local governments to plan for and adapt to sea level rise.
 - viii. Mechanisms to promote the use of "living shoreline" management methods on estuarine shorelines, and explore incentives and regulatory changes that would encourage the use of climate-ready erosion control strategies.
 - ix. Direct the NC Albemarle/Pamlico National Estuary Program to review the U.S. EPA's proposed "Climate Ready Estuaries" program and plan for and adapt to climate change and sea level rise in its work.
 - x. Evaluate the disclosure of coastal hazards to prospective purchasers of coastal property.

Energy Efficiency and Conservation:

- 2. Develop and implement more comprehensive lifecycle cost calculations for energy consumption by new buildings than are currently required under State law.
- 3. Provide additional financial support and incentives for public and private investments in conservation and efficiency.
- 4. Increase implementation and enforcement of existing policies that promote conservation and efficiency.
- 5. Continue to invest in job creation through conservation and efficiency programs.

Electricity and Power Generation:

6. Develop a comprehensive permitting system for wind energy facilities. Senate Bill 1068 (Permitting of Wind Energy Facilities) was introduced during the 2009 Session of the General Assembly).
7. CAPAG Energy Supply Option ES-5: Legislative changes to address environmental and other factors:
 - a. Evaluate and revise Utilities Commission guiding language for electric utilities to significantly increase their investment in conservation, efficiency, and renewable energy sources.
 - b. Allow utilities to make higher profit from kilowatts saved than kilowatts generated, e.g., through efficiency and conservation programs.
 - c. Consider the inclusion of a carbon adder (see CAPAG ES-5) requiring utilities to consider potential future carbon costs when developing their biennial integrated resource plans (IRPs).
8. Encourage or provide incentives for switching from electric to gas appliances, or vice versa, due to differences in delivered efficiency, if potential benefits are demonstrated.
9. Simplify the net-metering sign up process and increase the kWh purchase price for energy from renewable sources under that program.
10. Remove remaining barriers for interconnection.
11. Develop policies to prohibit the construction of new coal-fired power plants that do not capture and sequester carbon dioxide, and set a timetable to phase out existing coal plants that do not capture and sequester carbon dioxide.
12. Make changes to the State renewable energy portfolio standard (REPS) to allow greater use of combined heat and power (CHP) and energy recycling technologies.
13. CAPAG Energy Supply Options ES-3 and ES-9: Remove the barriers to implementation and permitting of energy recycling.
14. Authorize the sale of thermal energy including hot water and steam, to neighboring facilities by repealing NCGS § 62-110.2 or by revising the statute to authorize the sale of heat, hot water or steam by a third party non-utility up to a cap based on the quantity of energy sold.
15. Provide additional incentives to encourage demand side management (CAPAG RCI-1).
16. Expand existing tax credits and enact new tax incentives to promote increased utilization of combined heat and power.

17. Direct the North Carolina Utilities Commission to require utilities to investigate and develop energy efficiency (demand side management) initiatives to the maximum cost-effective level, including technologies such as the introduction of smart metering devices for all residential and commercial customers.
18. Consider the feasibility and suitability of establishing a feed-in rate or tariff to be paid to renewable energy producers by electric power suppliers for each kilowatt-hour of energy produced over a fixed term.
19. CAPAG Energy Supply Option ES-7: Public Benefits Fund. Evaluate the potential benefits of a public benefit charge or independent administrator for energy efficiency activities. (House Bill 1050 (NC Saves Energy) was introduced during the 2009 Session of the General Assembly and the Utilities Commission considered a proposal in Docket No. E-100 Sub 120).
20. Ensure sustainable utilization of biomass by clarifying the definition of ‘renewable energy resource’ in relation to woody biomass” and “require the adoption of forest management guidelines or adoption of third party sustainability standards" utilizing the comments and recommendations provided by the Environmental Management Commission in its report "*Evaluation of the Natural Resource Impacts of the Woody Biomass Industry in North Carolina.*"
21. The General Assembly should direct the Department of Environment and Natural Resources to examine the positive and negative environmental impacts of increased utilization of biomass five years after implementation of SB3, or five years after the first commercial production of cellulosic biofuels in the State, whichever comes first.
22. Examine the desirability and feasibility of developing and encouraging new nuclear baseload electric supply in the State.

Development and Transportation:

23. Consideration of additional CAPAG Transportation and Land Use Options (TLU-1 through TLU-13).
24. Change DOT long-range planning for new road construction and road-widening so it reduces annual vehicle miles traveled and anticipates population densities that can support public transportation.
25. Support a mandate to significantly improve vehicle fuel efficiency in state and local fleets and encourage alternative fuel vehicles, including compressed natural gas vehicles.
26. Continue to promote transportation initiatives that reduce greenhouse gas emissions. Examples include efforts to promote transit use and bike and pedestrian accessibility; programs to reduce vehicle miles traveled; and green vehicle purchase incentives.

27. Consider the implementation of a low emission vehicle program that is functionally equivalent to California's program.

Building practices and Standards:

28. CAPAG Residential, Commercial, and Industrial Option RCI-6: Require the Building Code Council to adopt the latest published version of the International Building Code, in particular the International Energy Conservation Code (IECC), within six months of its publication.
29. Require new, renovated, and expanded commercial and government buildings to comply with the latest version of the IECC.
30. CAPAG Residential, Commercial, and Industrial Option RCI-7: Consider development of "beyond code" building design incentives and targets, incorporating local building materials and advanced construction.
31. Expand existing tax credits for energy efficiency and enact new tax incentives that would promote the construction of energy efficient houses, including modular home and manufactured housing.

Greenhouse Gas Reduction Plan and Emissions Tracking:

32. Adopt a resolution supporting federal legislation related to a national cap on greenhouse gas emissions and comprehensive legislation on climate change and energy.
33. CAPAG Cross-Cutting Issues Options CC-1, CC-2, and CC-3: Develop greenhouse gas inventory and forecast, reporting, and registry. This registry should include emission reductions from renewable energy generation, energy efficiency programs, and other low carbon energy and transportation related measures.
34. Encourage and promote voluntary actions from corporations, individuals, government operations, and municipalities to reduce carbon emissions.

Agriculture/Forestry/Offsets:

35. Study the feasibility and advisability of establishing carbon offset credits program in State for agriculture and forestry practices.
36. Promote development of soil carbon and forest carbon sequestration opportunities in the State.

37. Support continued implementation of S.L. 2007-523 (Swine Farm Env. Performance Standards), including consideration of the following options:
 - a. increased financial support for the lagoon conversion program.
 - b. expansion of the swine farm methane capture pilot program.
 - c. Mandatory phase-out of existing lagoons that do not meet environmental performance standards.
38. Evaluate potential uses of biochar and microalgae.
39. CAPAG Agriculture, Forestry, and Waste Options AFW-11 and AFW-12: Promote policies that decrease GHG emissions associated with solid waste management.

Cross-cutting Issues/ Education/Outreach:

40. Encourage additional outreach to provide public education and technical assistance in each category.
41. Make maps, data, and other information related to climate change widely available.
42. Develop training and educational opportunities to improve awareness of climate change impacts, mitigation options, and adaptation measures.

LEGISLATIVE PROPOSALS

Based on the findings and recommendations listed above, the Legislative Commission on Global Climate Change recommends the following legislative proposals for consideration to the 2010 Session of the General Assembly:

1. *The General Assembly should enact a permanent climate commission and separate technical advisory committee.*
 - a. (Legislative proposal #1).
 - b. The new commission, with the assistance of the advisory committee, will continue to evaluate the additional General Policy Recommendations listed above.
 - c. The new commission will receive reports directed below from DENR, the Utilities Commission, the Department of Commerce, and other agencies.
2. *The General Assembly should direct the Department of Environment and Natural Resources, with the full participation and assistance of other State agencies, to develop a State climate change adaptation plan.*
 - a. (Legislative proposal #2).
 - b. CAPAG Cross-Cutting Option 2 (CC-5)
 - c. The plan may include an evaluation of the elements listed in adaptation section of the "Recommendations for Future Consideration" listed above.
3. *The General Assembly should direct the Utilities Commission to evaluate various mechanisms and programs that could result in further improvements in energy efficiency and conservation, as well as those that reduce carbon emissions.*
 - a. (Legislative proposal #3).
 - b. Could include an evaluation of items #6 -16 in the "Recommendations for Future Consideration" listed above.
4. *The General Assembly should direct Department of Commerce, in conjunction with DENR and the Department of Agriculture and Consumer Services to (a) study of carbon offset and carbon sequestration potential in North Carolina; and (b) investigate the feasibility and desirability of establishing a carbon sequestration market place in NC.*
 - a. (Legislative proposal #4).
 - b. Could incorporate "Recommendations for Future Consideration" #26-30 above.
5. *The General Assembly should provide funding for improved data collection and monitoring of climate change and its impacts on North Carolina.*
 - a. (Legislative proposal #5).
 - b. \$500,000 appropriation to expand the existing North Carolina Environment and Climate Observing Network (ECONet).

- c. \$500,000 appropriation to create a coastal adaptation resource mapping and monitoring program (CARMAP) based on the existing framework available in DENR and the UNC System.
- d. Make information collected under these programs publicly available.

6. *The General Assembly should amend the General Statutes related to State long-term planning and environmental review programs to require consideration of environmental impacts associated with climate change.*

- a. (Legislative proposal #6)
 - i. Amend the State Environmental Policy Act (SEPA), G.S. 113A-1 et seq., to add consideration of emission of greenhouse gases, climate change, and sea level rise to issues that must be addressed in environmental documents.
 - ii. Amend the Coastal Area Management Act (CAMA), G.S. 113A-100 et seq., to require the Coastal Resources Commission, the Division of Coastal Management, and local governments to consider sea level rise when approving land use plans and major CAMA permits.
 - iii. Amend G.S. 143-279.8 to direct DENR to evaluate and consider the impacts of climate change and sea level rise when developing its coastal habitat protection plan (CHPP).
 - iv. Amend G.S. 62-110.1 to require the utilities in the State to consider the impacts of climate change in their biennial integrated resource plan (IRP) filings.
 - v. Direct the Board of Transportation to consider climate change impacts as part of its development and approval of the State Transportation Improvement Program (TIP) Plan.
 - vi. Identify and evaluate other areas where the State is involved in long-term planning.

7. *The General Assembly adopt a resolution supporting federal legislation related to a national cap on greenhouse gas emissions and comprehensive legislation on climate change and energy.*

1 A BILL TO BE ENTITLED
2 AN ACT TO ESTABLISH THE NORTH CAROLINA COMMISSION ON CLIMATE
3 CHANGE AND TO ESTABLISH THE ADVISORY COUNCIL TO THE NORTH
4 CAROLINA COMMISSION ON CLIMATE CHANGE, AS RECOMMENDED BY
5 THE LEGISLATIVE COMMISSION ON GLOBAL CLIMATE CHANGE.

6 The General Assembly of North Carolina enacts:

7 **SECTION 1.** Chapter 120 of the General Statutes is amended by adding a
8 new Article to read:

9 "Article 12Q.

10 "North Carolina Commission on Climate Change.

11 **"§ 120-70.150. Commission established.**

12 The North Carolina Commission on Climate Change is established.

13 **"§ 120-70.151. Membership; cochairs; meetings; vacancies; quorum.**

14 (a) The North Carolina Commission on Climate Change shall consist of 15
15 members as follows:

16 (1) Five Senators appointed by the President Pro Tempore of the Senate.

17 (2) Five Representatives appointed by the Speaker of the House of
18 Representatives.

19 (3) Five members from the executive branch to be appointed by the
20 Governor.

21 (b) Members of the Commission shall serve at the pleasure of their appointing
22 officers.

23 (c) The President Pro Tempore of the Senate shall designate one Senator to serve
24 as Cochair, and the Speaker of the House of Representatives shall designate one
25 Representative to serve as Cochair.

26 (d) Except as otherwise provided in this subsection, a legislative member of the
27 Commission shall continue to serve for so long as the member remains a member of the
28 General Assembly and no successor has been appointed. A legislative member of the
29 Commission who does not seek reelection or is not reelected to the General Assembly
30 may complete a term of service on the Commission until the day on which a new General
31 Assembly convenes. A legislative member of the Commission who resigns or is removed
32 from service in the General Assembly shall be deemed to have resigned or been removed
33 from service on the Commission. Appointed members shall serve at the pleasure of their
34 appointing officer. Any vacancy that occurs on the Commission shall be filled in the
35 same manner as the original appointment.

36 (e) A quorum of the Commission shall consist of eight members.

37 **"§ 120-70.152. Powers and duties.**

38 (a) The North Carolina Commission on Climate Change shall have the following
39 powers and duties:

40 (1) To study issues related to global climate change. This study may include
41 consideration of any of the following:

42 a. Actions taken by the federal government, other states, and other
43 nations regarding global climate change.

- b. Economic opportunities that may arise from international, national, and state actions to address global climate change and the emerging carbon market.
 - c. Existing and potential impacts of global climate change on the citizens, natural resources, ecosystems, and economy of the State, including public health, the environment, agriculture, travel and tourism, recreation, coastal real estate, insurance, and other sectors of the economy.
 - d. Costs associated with actions taken by the State to address global climate change, including costs to individuals, households, local governments, businesses, educational institutions, agricultural operations, the State, and other institutions and sectors of the economy.
 - e. Benefits associated with actions taken by the State, the federal government, other states, and other nations to address global climate change, including benefits to individuals, households, local governments, businesses, educational institutions, agricultural operations, the State, and other institutions and sectors of the economy.
- (2) To review changes in federal law related to global climate change.
 - (3) To review changes in technology related to global climate change.
 - (4) To review existing and potential State law related to global climate change and to determine whether modifications to State law related to global climate change are in the public interest.
 - (5) To undertake any additional studies related to global climate change as determined by the Cochairs, the President Pro Tempore of the Senate, the Speaker of the House of Representatives, or the Governor.
 - (6) To make reports and recommendations, including legislative proposals, to the General Assembly and the Governor from time to time as to any matter related to global climate change.
- (b) The Commission may seek the assistance of the Advisory Council to the North Carolina Commission on Climate Change established by G.S. 120-70.157.
- (c) The Commission may work cooperatively with other global climate change entities and State agencies with respect to their areas of responsibility regarding greenhouse gas emissions and global climate change.
- "§ 120-70.153. Additional powers.**
- (a) The North Carolina Commission on Climate Change, while in the discharge of its official duties, may exercise all the powers provided for under the provisions of G.S. 120-19, and G.S. 120-19.1 through G.S. 120-19.4. The Commission may meet at any time upon the call of either Cochair, whether or not the General Assembly is in session. The Commission may meet in the Legislative Building or the Legislative Office Building upon the approval of the Legislative Services Commission.

(b) Notwithstanding any rule or resolution to the contrary, proposed legislation to implement any recommendation of the Commission regarding any study the Commission is authorized to undertake or any report authorized or required to be made by or to the Commission may be introduced and considered during any session of the General Assembly.

(c) The Commission may contract for consultants or hire employees in accordance with G.S. 120-32.02.

"§ 120-70.154. Compensation and expenses of members.

Members of the North Carolina Commission on Climate Change shall receive subsistence and travel expenses at the rates set forth in G.S. 120-3.1.

"§ 120-70.155. Staffing.

The Legislative Services Officer shall assign as staff to the North Carolina Commission on Climate Change professional employees of the General Assembly, as approved by the Legislative Services Commission. Clerical staff shall be assigned to the Commission through the offices of the Directors of the Legislative Assistants of the Senate and House of Representatives. The expenses of employment of clerical staff shall be borne by the Commission.

"§ 120-70.156. Funding.

From funds available to the General Assembly, the Legislative Services Commission shall allocate monies to fund the work of the North Carolina Commission on Climate Change.

"§ 120-70.157. Advisory Council established.

The Advisory Council of the North Carolina Commission on Climate Change is established.

"§ 120-70.158. Powers and duties.(a) The purpose of the Advisory Council of the North Carolina Commission on Climate Change shall be to assist the Commission on Climate Change on matters requested by the Commission as the Commission fulfills its duties under G.S. 120-70.152 and G.S. 120-70.153.(b) The authority granted to the Advisory Council shall be advisory in nature and in no way shall the Advisory Council be construed to have any regulatory authority.

"§ 120-70.159. Membership; meetings; vacancies; quorum.

(a) The Advisory Council of the North Carolina Commission on Climate Change shall consist of 20 members as follows:

- (1) The President of Duke Power or the President's designee.
- (2) The President of Progress Energy or the President's designee.
- (3) The President of the North Carolina Chamber or the President's designee.
- (4) The President of the Manufacturers and Chemical Industry Council of North Carolina or the President's designee.
- (5) The President of the North Carolina Farm Bureau Federation or the President's designee.
- (6) The President of the North Carolina Forestry Association or the President's designee.

- (7) The Southeast Director of Climate and Air Policy of Environmental Defense or the Southeast Regional Director's designee.
 - (8) The Executive Director of the Southern Alliance for Clean Energy or the Executive Director's designee.
 - (9) The Executive Director of the North Carolina Coastal Federation or the Executive Director's designee.
 - (10) The Executive Director of the North Carolina Conservation Council or the Executive Director's designee.
 - (11) The Director of the Nicholas Institute for Environmental Policy Solutions at Duke University or the Director's designee.
 - (12) The Dean of the College of Agriculture and Life Sciences at North Carolina State University or the Dean's designee.
 - (13) The Dean of the School of Agriculture and Environmental Sciences at North Carolina Agricultural and Technical State University or the Dean's designee.
 - (14) The Director of the Institute for the Environment at the University of North Carolina at Chapel Hill or the Director's designee.
 - (15) The Distinguished Research Professor (with expertise in sea level change) in the Department of Geology at East Carolina University.
 - (16) The North Carolina State Climatologist.
 - (17) Two designees appointed by the President Pro Tempore of the Senate, who shall serve at the pleasure of their appointing officer.
 - (18) Two designees appointed by the Speaker of the House of Representatives, who shall serve at the pleasure of their appointing officer.
- (b) The members of the Advisory Council shall elect a Chair, Vice-Chair, and any other officers they consider necessary. The term of office for any elected member shall not exceed one year.
- (c) Any vacancy on the Advisory Council shall be filled by the original appointing authority.
- (d) Any member of the Advisory Council may hold concurrently any other elected or appointed office, as authorized by G.S. 128-1.1 and Article VI, Section 9, of the Constitution of North Carolina. The authorization provided by this subsection shall not apply to members of the North Carolina Commission on Climate Change.
- (e) The Advisory Council shall meet upon the call of the Chair. A majority of the Council shall constitute a quorum for the transaction of business.
- "§ 120-70.160. Expenses of members.**
- Members of the Advisory Council of the North Carolina Commission on Climate Change shall receive per diem, subsistence, and travel allowances in accordance with G.S. 120-3.1, 138-5, or 138-6, as appropriate."
- SECTION 2.** This act is effective when it becomes law.

A BILL TO BE ENTITLED

AN ACT TO DIRECT THE DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES TO DEVELOP THE NORTH CAROLINA CLIMATE CHANGE ADAPTATION STRATEGY, AS RECOMMENDED BY THE LEGISLATIVE COMMISSION ON GLOBAL CLIMATE CHANGE.

The General Assembly of North Carolina enacts:

SECTION 1. The North Carolina Climate Change Adaptation Strategy. – The Department of Environment and Natural Resources shall develop the North Carolina Climate Change Adaptation Strategy, a comprehensive strategy to adapt to the impacts to North Carolina associated with global climate change. The Strategy shall consist of an assessment as provided under Section 2 of this act and a comprehensive plan as provided under Section 3 of this act. The North Carolina Climate Change Adaptation Strategy shall include climate adaptation goals and principles that shall be reflected in the comprehensive plan. The Strategy shall identify a mechanism and process to assess whether any modification to the Strategy is needed based on the latest science or information as it becomes available over time, and, if modification is needed, a process to implement the modification. In developing the Strategy, the Department of Environment and Natural Resources shall seek the participation and cooperation of the Department of Transportation, the Department of Crime Control and Public Safety, the Department of Insurance, the Department of Administration, the Department of Agriculture and Consumer Services, the Department of Commerce, the Department of Public Instruction, the Department of Cultural Resources, the North Carolina Wildlife Resources Commission, and any other State agency or commission that might have a role or be affected by global climate change. In developing the Strategy, the Department of Environment and Natural Resources may seek the input of any appropriate federal agency, such as the United States Army Corps of Engineers, the Federal Highway Administration, the United States Fish and Wildlife Service, the United States Environmental Protection Agency (USEPA), or the National Marine Fisheries Service; any university; any nongovernmental organization; or any unit of local government.

SECTION 2. The North Carolina Climate Change Adaptation Assessment. – In developing the North Carolina Climate Change Adaptation Strategy, the Department of Environment and Natural Resources first shall conduct an assessment that, based on the best available science, accomplishes at least all of the following tasks:

- (1) Identifies the projected impacts to North Carolina associated with global climate change, including at least all of the following potential impacts:
 - a. Sea level rise.
 - b. More frequent and intense heat waves.
 - c. Increased air and water temperature.
 - d. Increased storm intensity and frequency.
 - e. Altered rainfall patterns that may result in droughts, floods, and fires.
 - f. Shoreline erosion that may result in land loss and other ecosystem change.

- (2) Determines the range of projections of the impacts identified under subdivision (1) of this subsection and the degree of confidence in these projections.
- (3) Identifies which resources of the State are threatened by impacts identified under subdivision (1) of this subsection, giving consideration to at least all of the following resources:
 - a. The natural resources of the coastal, Piedmont, and mountain regions of the State.
 - b. Public, residential, commercial, and industrial buildings.
 - c. Transportation and other essential infrastructure.
 - d. Water supplies.
 - e. Commercial activities, including agriculture and forestry.
 - f. Public health.
 - g. Recreational and conservation lands.
- (4) Identifies which of the impacts identified under subdivision (1) of this subsection should receive the highest priority to be addressed with adaptation measures based upon the severity or certainty of the impact and the level of the threat to the public, natural resources, or the State or local economies.
- (5) Initiates an economic cost and benefit analysis to determine the potential costs of maintaining the status quo compared with the costs of implementing the North Carolina Climate Change Adaptation Plan under Section 3 of this act.

SECTION 3.(a) The North Carolina Climate Change Adaptation Plan. – After conducting the Assessment under Section 2 of this act, the Department of Environment and Natural Resources shall develop the North Carolina Climate Change Adaptation Plan, a comprehensive plan to adapt to the unavoidable impacts and associated threats that are identified in the Assessment, for the purpose of maximizing the security of North Carolina's citizens, natural resources, essential infrastructure, and economic vitality. The Plan shall provide a strategy that accomplishes at least all of the following:

- (1) Develops an inventory of existing federal, state, or local programs and plans that address adaptation to climate change.
- (2) Identifies needed changes to existing planning tools and identifies new planning tools that are needed in order to take into account projected impacts from climate change, including at least all of the following all of the following:
 - a. Floodplain mapping.
 - b. Steep slope mapping.
 - c. Basinwide water planning.
 - d. Coastal zone planning.
 - e. Beach and shoreline planning.
 - f. Transportation and other infrastructure planning.

- (3) Identifies needed changes to State policies, programs, statutes, and administrative rules in order to implement physical adaptation measures, stimulate market responses, provide appropriate incentives, and regulate future activities that may be affected by global climate change.
- (4) Identifies adaptation measures as short-term, mid-term, and long-term adaptation measures and establishes a method by which adaptation measures are to be prioritized.
- (5) Identifies methods to better coordinate and integrate State natural hazard planning and regulatory programs in the Department of Environment and Natural Resources and the Department of Crime Control and Public Safety.
- (6) Directs the Department of Environment and Natural Resources or the Division of Emergency Management of the Department of Crime Control and Public Safety to integrate post-disaster planning requirements with hazard mitigation planning requirements into one plan that includes the latest scientific understanding of sea level rise, erosion, and other coastal hazards and environmental impacts of global climate change.

SECTION 3.(b) Considerations in Developing or Modifying the Plan. – When developing or modifying the Plan, all of the following policy approaches to adaptation may be considered:

- (1) Developing plans that address how local governments in the coastal plain can adapt to potential changes in property tax revenue as sea-level increases lead to land loss.
- (2) Directing the Coastal Resources Commission to increase protection of coastal wetlands and their ability to migrate inland by the Commission prohibiting new bulkheads and hardened structures in certain areas of environmental concern, as designated by the Coastal Resources Commission under G.S. 113A-113.
- (3) Utilizing the consistency provisions of the Coastal Area Management Act (CAMA), Article 7 of Chapter 113A of the General Statutes, and the federal Coastal Zone Management Act, 16 U.S.C. § 1451, et seq., to help resolve conflicts between existing State and federal policies and programs.
- (4) Requiring the Division of Coastal Management of the Department of Environment and Natural Resources to report on the loss of coastal wetlands due to estuarine shoreline hardening and other uses to the Environmental Review Commission and any future legislative commission that directly and primarily addresses issues concerning global climate change.
- (5) Requiring an applicant for a permit under CAMA to mitigate the applicant's impact on wetlands that may result from any hardening of the estuarine shoreline outside of areas of environmental concern.

- (6) Authorizing coastal management grants to units of local government to be used for planning for, and adapting to, sea level rise.
- (7) Making maps of sea level rise available on the Internet for the use of units of local government, realtors, conservation organizations, and the general public.
- (8) In order to protect the public recreational beaches, identifying options for responding to erosion hazards and for planning for sea level rise.
- (9) Promoting the use of any of the following living shoreline management methods so that estuarine shorelines are protected:
 - a. Restoring, enhancing, or protecting existing wetland or riparian vegetation.
 - b. Constructing a marsh sill.
 - c. Using other engineered structures approved by the Department of Environment and Natural Resources to maintain, restore, or enhance the shoreline's natural habitats.
- (10) Developing incentives and regulatory changes to encourage the use of the Climate Ready Estuaries program, a program developed by the USEPA to train coastal managers to protect the estuaries and coastal areas that are particularly vulnerable to climate variability and change climate; assess climate change vulnerabilities; develop and implement adaptation strategies; engage and educate stakeholders; and share the information gained with other coastal managers.
- (11) Requesting the Albemarle - Pamlico National Estuary Program, a cooperative program jointly sponsored by the Department of Environment and Natural Resources and the USEPA in cooperation with the Virginia Department on Conservation and Recreation, to review the USEPA's Climate Ready Estuaries program and plan for and adapt to climate change and sea level rise.
- (12) Determining any funding needs related to adaptation and mitigation and considering possible funding resources to address such needs.
- (13) Pursuing federal funding for a southeast regional adaptation study, a study to assist in the development of relocation and removal strategies that uses the existing authority of the United States Army Corps of Engineers.
- (14) Developing plans for geo-zoning of the barrier islands and estuarine shore zone environments within coastal North Carolina.
- (15) Identifying the reasons for and against adopting either a strategy of in situ management of adaptation measures as opposed to the strategy of retreating from the high hazard ocean and inlet shorelines and estuarine shorelines.
- (16) Determining possible cost-sharing incentives with land owners for the costs of constructing ecologically beneficial erosion control structures on estuarine shorelines.

- (17) Identifying new economic opportunities within the eastern North Carolina coastal system, the Piedmont, and the mountain regions of the State based upon the impacts identified under subsection (1) of section 2 of this act and the resulting adaptations to these impacts.
- (18) Directing the Coastal Resources Commission to delineate economically viable and environmentally sound ways to address various scenarios regarding potential sea-level rise in each the short term, the mid term, and the long term, based on the information in its 2010 Science Panel report.
- (19) Identifying mechanisms for purchasing land or conservation easements on portions of coastal and inlet hazard zones, as well as other portions of the low-lying coastal zone, that are identified as at risk.
- (20) Developing and implementing a method of tracking ecosystem changes resulting from climatic shifts, with specific focus on those resources that have direct economic priorities, such as tourism, agriculture, silviculture, and marine fisheries.
- (21) Evaluating the reasons for and against a requirement that sellers of coastal properties disclose potential hazards to buyers and a requirement that this disclosure accompany all real estate transfers of properties within coastal counties that either are directly on ocean, inlet, or estuarine shoreline frontage or are located within a 100-year floodplain.

SECTION 4. Database Framework. – The Department of Environment and Natural Resources and the universities within The University of North Carolina jointly shall develop a framework for a database to provide to the general public and others information related to making economically and environmentally prudent adaptation decisions. This database may include maps, surveys, inventories, and other relevant, useful information. The Department of Environment and Natural Resources may improve current permanent monitoring stations and may install new permanent monitoring stations within the North Carolina coastal zone, as required to develop the database under this section.

SECTION 5. Report Requirement. – Beginning no later than October 1, 2010, the Department of Environment and Natural Resources shall submit quarterly progress reports to the Environmental Review Commission and to any future legislative commission that directly and primarily addresses issues concerning global climate. No later than January 1, 2012, the Department of Environment and Natural Resources shall submit a final report that shall include the North Carolina Climate Change Adaptation Strategy to the Environmental Review Commission and to any future legislative commission that directly and primarily addresses issues concerning global climate change.

SECTION 6. Appropriation. – There is appropriated from the General Fund to the Department of Environment and Natural Resources the sum of fifty thousand dollars (\$50,000) for the 2010-2011 fiscal to implement the provisions of this act.

SECTION 7. Effective Date. – This act becomes effective July 1, 2010.

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1 A BILL TO BE ENTITLED
2 AN ACT TO DIRECT THE UTILITIES COMMISSION TO IDENTIFY, STUDY, AND
3 RECOMMEND POLICIES TO INCREASE ENERGY EFFICIENCY AND
4 CONSERVATION, PROMOTE RENEWABLE ENERGY RESOURCES, AND
5 REDUCE CARBON EMISSIONS, AS RECOMMENDED BY THE LEGISLATIVE
6 COMMISSION ON GLOBAL CLIMATE CHANGE.

7 The General Assembly of North Carolina enacts:

8 **SECTION 1.** The Utilities Commission shall identify, study, and recommend
9 policies to increase energy efficiency and conservation, promote the development of
10 renewable energy resources, and reduce carbon emissions. The Commission shall
11 specifically consider:

- 12 (1) Revision of the Commission's guiding language for electric utilities in
13 order to promote significant increases in electric utility investment in
14 energy efficiency, conservation, and renewable energy resources.
- 15 (2) Incentives to encourage demand side management.
- 16 (3) Incentives to encourage the use of more energy efficient appliances.
- 17 (4) Allowing electric utilities to earn more from energy saved through
18 efficiency and conservation programs than from energy generated.
- 19 (5) Policies to encourage the development of wind energy.
- 20 (6) Simplifying the net-metering sign up process and increasing the
21 purchase price for energy generated from renewable energy resources
22 under the net-metering program.
- 23 (7) Removing barriers to interconnection.
- 24 (8) Requiring electric utilities to include potential future carbon costs when
25 developing their biennial integrated resource plans.
- 26 (9) Prohibiting the construction of new coal-fired power plants that do not
27 capture and sequester carbon dioxide.
- 28 (10) Changes to the State renewable energy portfolio standard to allow
29 greater use of combined heat and power and energy recycling
30 technologies.
- 31 (11) Removing barriers to implementation and permitting of energy
32 recycling.
- 33 (12) Authorizing the sale of thermal energy.
- 34 (13) The potential benefits of a public benefit charge or independent
35 administrator for energy efficiency activities.

36 **SECTION 2.** The Commission may submit an interim report of its findings
37 and recommendations to the Environmental Review Commission and the Joint
38 Legislative Utility Review Committee no later than December 1, 2010, and shall submit a
39 final report of its findings and recommendations to the Environmental Review
40 Commission and the Joint Legislative Utility Review Committee no later than December
41 1, 2011.

42 **SECTION 3.** This act is effective when it becomes law.
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1 A BILL TO BE ENTITLED
2 AN ACT TO DIRECT THE DEPARTMENT OF AGRICULTURE AND CONSUMER
3 SERVICES, THE DEPARTMENT OF COMMERCE, AND THE DEPARTMENT
4 OF ENVIRONMENT AND NATURAL RESOURCES TO EVALUATE THE
5 CARBON SEQUESTRATION POTENTIAL OF NORTH CAROLINA'S
6 AGRICULTURAL LANDS, FORESTLANDS, AND OTHER WORKING
7 LANDSCAPES; TO STUDY OTHER OPPORTUNITIES TO DEVELOP CARBON
8 OFFSETS WITHIN THE STATE; AND TO STUDY THE FEASIBILITY AND
9 ADVISABILITY OF ESTABLISHING A CARBON OFFSET PROGRAM IN THE
10 STATE, AS RECOMMENDED BY THE LEGISLATIVE COMMISSION ON
11 GLOBAL CLIMATE CHANGE.

12 The General Assembly of North Carolina enacts:

13 **SECTION 1.(a)** Definitions. – As used in this act:

- 14 (1) "Cap and trade program" means any program that places a limit, or cap,
15 on the total amount of greenhouse gas emissions that is allowed under
16 the specific target for greenhouse gas emissions set under the program,
17 allocates greenhouse gas emissions as credits to individual businesses so
18 that the total credits allocated equal the cap, and allows businesses to
19 bank credits for the future or to buy and sell credits based on whether a
20 particular business reduced or increased its greenhouse gas emissions in
21 a given year and the value of the credits in the marketplace.
- 22 (2) "Carbon offset" means the credit given for activities that result in the
23 reduction or avoidance of greenhouse gas emissions, or for the
24 sequestration of greenhouse gases. For the purposes of this act, one
25 carbon offset shall be equal to the reduction, avoidance, or sequestration
26 of one metric ton of carbon dioxide emissions or its functional
27 equivalent in other greenhouse gases.
- 28 (3) "Carbon sequestration" means the absorption from the atmosphere of
29 carbon dioxide by vegetation and soils; and the storage of carbon in
30 vegetation and soils.
- 31 (4) "Greenhouse gas" means any gas that contributes to anthropogenic
32 global warming including, but not limited to, carbon dioxide, methane,
33 nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur
34 hexafluoride

35 **SECTION 1.(b)** Study. – The Department of Agriculture and Consumer
36 Services, the Department of Commerce, and the Department of Environment and Natural
37 Resources shall jointly evaluate all of the following:

- 38 (1) The carbon sequestration or reduced emission potential of the
39 agricultural, forestlands, and other working landscapes in the State from
40 the following practices:
41 (a) Alternative farming practices.
42 (b) Soil carbon management and storage.

- (c) Reduced methane emissions from animal waste management systems.
- (d) Alternative methods of forest management that can increase carbon sequestration and reduce the loss of carbon sequestration to wildfire, accounting for changes in the mortality and distribution of tree and other plant species, and the extent to which carbon is stored in tree-based building materials.
- (e) Avoided conversion of agricultural and forestlands.
- (f) Other practices that the agencies find relevant.
- (2) Current and developing technologies for carbon sequestration, including the potential use of microalgae and biochar.
- (3) Existing carbon sequestration and carbon offset programs and policies, including voluntary programs.
- (4) Standards and certification regimes in place for verifying the benefits of carbon sequestration and carbon offset programs.
- (5) The anticipated costs for farmers, foresters, and other interested parties in the State to participate as offset providers in a cap and trade program for greenhouse gas emissions, including the costs of monitoring greenhouse gas emissions, satisfying reporting requirements, and any other costs.
- (6) The anticipated benefits for farmers, foresters, and other interested parties in the State to participate as offset providers in a cap and trade program for greenhouse gas emissions, including any likely increase their annual incomes.
- (7) Other co-benefits associated with activities related to carbon sequestration in the State, including improved water quality, air quality, and wildlife habitat.
- (7) The advantages and disadvantages to the State in developing or implementing its own carbon offset certification programs or carbon offset trading systems in the event a federal cap and trade program for greenhouse gas emissions is enacted.
- (8) Any other issues the agencies consider relevant to this topic.

SECTION 1.(c) Consultants. – In the conduct of this study, the agencies may employ independent consultants as provided by G.S. 120-32.02 and G.S. 120-70.44.

SECTION 1.(d) Advisory committee. – The agencies may convene an advisory committee of interested parties to assist in the design and implementation of the study.

SECTION 1.(e) Report. – The agencies may submit an interim report of their findings and recommendations to the Environmental Review Commission no later than December 1, 2010. The agencies shall submit a final report of their findings and recommendations, including any legislative proposals, to the General Assembly on or before April 1, 2011.

SECTION 2. This act is effective when it becomes law.

A BILL TO BE ENTITLED

AN ACT TO APPROPRIATE FUNDS (1) TO ESTABLISH THE COASTAL ADAPTATION RESOURCES MAPPING AND MONITORING PROGRAM AND (2) TO EXPAND THE NORTH CAROLINA ENVIRONMENT AND CLIMATE OBSERVING NETWORK; IN ORDER TO PROVIDE FOR MONITORING OF THE ENVIRONMENTAL IMPACTS OF GLOBAL CLIMATE CHANGE IN NORTH CAROLINA AND FOR IMPROVING WEATHER AND CLIMATE DATA COLLECTION IN NORTH CAROLINA, AS RECOMMENDED BY THE LEGISLATIVE COMMISSION ON GLOBAL CLIMATE CHANGE.

The General Assembly of North Carolina enacts:

SECTION 1.(a) The Coastal Adaptation Resources Mapping and Monitoring Program (CARMAP) is established within the Department of Environment and Natural Resources. This program shall be a cooperative program that utilizes the resources within the Department and the constituent universities within The University of North Carolina. This program shall provide the framework for mapping and inventorying the State's extensive coastal and riverine resources, to include the land areas within the coastal zone; the ocean and estuarine shore zones; and sub-aquatic bathymetry; sediments; and vegetation. This framework shall include at least all of the following:

- (1) A field survey and inventory of the geologic and ecologic character of the entire shoreline system and maps that indicates the detailed distribution of shoreline types.
- (2) A field survey, inventory, and maps that indicate distribution of the anthropogenic modifications of the entire shoreline system, such as any hardened shoreline structures, piers, marinas, or channels.
- (3) For each five year period, a periodic coastal land survey that incorporates high resolution, geo-referenced, infrared aerial photography and LiDAR topography of the entire coastal zone in order to monitor absolute changes in shorelines, ecosystems, and land use.
- (4) A bathymetric survey of the inland coastal waters that can be utilized for detailed modeling of estuarine storm surge, water quality, and sea-level rise, as well as supplying critical data for modeling shoreline erosion, distribution of submerged aquatic vegetation, and ecosystem migration.
- (5) The framework for establishing various types of permanent monitoring stations within the State's coastal zone, which shall include at least all of the following monitoring stations:
 - a. A system of estuarine and riverine stations to measure absolute changes in sea-level rise, characterize the dynamics of storm surges and tides, and monitor water flow and quality through the coastal system.
 - b. A series of land-based sites in different ecosystems to monitor ecological change of habitats through time, including growth rates, structure and function, freshwater resources, saltwater

1 intrusion, sedimentation and erosion rates, and any other
2 changes.

3 c. Define the critical sediment sources and their depositional sinks
4 within the State's riverine, estuarine, and barrier island systems.

5 d. Develop realistic sediment budgets and monitors for sediment
6 transport directions and rates.

7 **SECTION 1.(b)** The Department of Environment and Natural Resources shall
8 make the information collected under CARMAP, as established under this section,
9 available to the general public on the Internet.

10 **SECTION 1.(c)** There is appropriated from the General Fund to the
11 Department of Environment and Natural Resources the sum of five hundred thousand
12 dollars (\$500,000) for the 2010-2011 fiscal year to fund CARMAP, as established under
13 this section.

14 **SECTION 2.(a)** There is appropriated from the General Fund to the State
15 Climate Office the sum of five hundred thousand dollars (\$500,000) for the 2010-2011
16 fiscal year to expand the North Carolina Environment and Climate Observing Network
17 (ECONet), a program supported by the State Climate Office, the Department of
18 Environment and Natural Resources, the Department of Crime Control and Public Safety,
19 and North Carolina State University, in cooperation with federal agencies, for the purpose
20 of providing a database that may be used to improve severe weather management,
21 weather forecasts, energy planning, and natural resource management, as well as assisting
22 agriculture, emergency response, natural resource management, tourism, economic
23 development, education, and other applications that affect North Carolina's citizens.

24 **SECTION 2.(b)** The funds appropriated under this section shall be used to
25 locate automated weather and environmental observing stations to counties that do not
26 currently have such stations, thereby expanding ECONet and moving toward the ultimate
27 goal of locating at least one weather and environmental observing station in each county
28 in North Carolina. Data from these stations shall be provided to government agencies to
29 improve severe weather management, weather forecasts, energy planning, and natural
30 resource management and shall be made available to the general public on the Internet.

31 **SECTION 3.** This act becomes effective July 1, 2010.

1 A BILL TO BE ENTITLED
2 AN ACT TO REQUIRE THE STATE TO CONSIDER IN ITS LONG-TERM
3 PLANNING AND ENVIRONMENTAL REVIEW PROGRAMS THE IMPACTS
4 ASSOCIATED WITH GLOBAL CLIMATE CHANGE, AS RECOMMENDED BY
5 THE LEGISLATIVE COMMISSION ON GLOBAL CLIMATE CHANGE.

6 The General Assembly of North Carolina enacts:

7 **PART I. DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**

8
9 **STATE ENVIRONMENTAL POLICY ACT**

10
11 **SECTION 1.1.** Article 1 of Chapter 113A of the General Statutes is amended
12 by adding a new section to read:

13 **"§ 113A-8.2. Consideration of impacts associated with global climate change.**

14 When a determination is being made under this Article as to whether an activity has
15 any environmental impact, consideration shall be given to both:

- 16 (1) The impacts of global climate change as these affect the activity.
17 (2) Whether and to what extent the activity would result in an increase or
18 decrease in greenhouse gas emissions."
19

20 **COASTAL AREA MANAGEMENT ACT (CAMA)**

21
22 **SECTION 1.2.(a)** G.S. 113A-107 is amended by adding a new subsection to
23 read:

24 "(a1) In addition to the provisions of subsection (a) of this section, State guidelines
25 for the coastal area shall take into consideration the impacts of global climate change as
26 these affect the public and private use of land and water areas within the coastal area."

27 **SECTION 1.2.(b)** G.S. 113A-120(b) reads as rewritten:

28 "(b) In the absence of such findings, a permit shall be granted. The permit may be
29 conditioned upon the applicant's amending his proposal to take whatever measures or
30 agreeing to carry out whatever terms of operation or use of the development that are
31 reasonably necessary to protect the public interest with respect to the factors enumerated
32 in subsection (a) of this section. When reviewing a permit application under this section,
33 the responsible official or body shall consider both:

- 34 (1) The impacts of global climate change as these affect the development.
35 (2) Whether and to what extent the development would result in an increase
36 or decrease in greenhouse gas emissions."
37

38 **COASTAL HABITAT PROTECTION PLANS**

39
40 **SECTION 1.3.** G.S. 143B-279.8(a) reads as rewritten:

41 "(a) The Department shall coordinate the preparation of draft Coastal Habitat
42 Protection Plans for critical fisheries habitats. The goal of the Plans shall be the long-term
43 enhancement of coastal fisheries associated with each coastal habitat identified in

subdivision (1) of this subsection. The Department shall use the staff of those divisions within the Department that have jurisdiction over marine fisheries, water quality, and coastal area management in the preparation of the Coastal Habitat Protection Plans and shall request assistance from other federal and State agencies as necessary. The plans shall:

- (1) Describe and classify biological systems in the habitats, including wetlands, fish spawning grounds, estuarine or aquatic endangered or threatened species, primary or secondary nursery areas, shellfish beds, submerged aquatic vegetation (SAV) beds, and habitats in outstanding resource waters.
- (2) Evaluate the function, value to coastal fisheries, status, and trends of the habitats.
- (3) Identify existing and potential threats to the habitats and the impact on coastal fishing.
- (3a) Consider impacts associated with global climate change.
- (4) Recommend actions to protect and restore the habitats."

SECTION 1.4. The Department of Environment and Natural Resources shall evaluate and identify any State long-term planning or any environmental review programs that consider environmental impacts and, no later than May 1, 2011, submit a report to the General Assembly itemizing these plans and programs. The Department shall include in its report which of these plans and programs already take into consideration the impacts associated with global climate change. The Department shall include in its report its recommendations as to which of these plans or programs should take into consideration the impacts associated with global climate change.

PART II. NORTH CAROLINA UTILITIES COMMISSION

SECTION 2. G.S. 62-110.1(c) reads as rewritten:

"(c) The Commission shall develop, publicize, and keep current an analysis of the long-range needs for expansion of facilities for the generation of electricity in North Carolina, including its estimate of the probable future growth of the use of electricity, the probable needed generating reserves, the extent, size, mix and general location of generating plants and arrangements for pooling power to the extent not regulated by the Federal Energy Regulatory Commission and other arrangements with other utilities and energy suppliers to achieve maximum efficiencies for the benefit of the people of North Carolina, and shall consider such analysis in acting upon any petition by any utility for construction. In developing such analysis, the Commission shall confer and consult with the public utilities in North Carolina, the utilities commissions or comparable agencies of neighboring states, the Federal Energy Regulatory Commission, the Southern Growth Policies Board, and other agencies having relevant information and may participate as it deems useful in any joint boards investigating generating plant sites or the probable need for future generating facilities. In addition to such reports as public utilities may be

1 required by statute or rule of the Commission to file with the Commission, any such
2 utility in North Carolina may submit to the Commission its proposals as to the future
3 needs for electricity to serve the people of the State or the area served by such utility, and
4 insofar as practicable, each such utility and the Attorney General may attend or be
5 represented at any formal conference conducted by the Commission in developing a plan
6 for the future requirements of electricity for North Carolina or this region. In the course
7 of conducting the analysis and developing the plan, the Commission shall consider both
8 (i) the impacts of global climate change and (ii) whether and to what extent
9 implementation of the plan would result in an increase or decrease in greenhouse gas
10 emissions. In the course of making the analysis and developing the plan, the Commission
11 shall conduct one or more public hearings. Each year, the Commission shall submit to the
12 Governor and to the appropriate committees of the General Assembly a report of its
13 analysis and plan, the progress to date in carrying out such plan, and the program of the
14 Commission for the ensuing year in connection with such plan."

PART III. DEPARTMENT OF TRANSPORTATION

18 **SECTION 3.** G.S. 143B-350 is amended by adding a new subsection to read:
19 "(f3) Consideration of impacts associated with global climate change. – In its
20 development and approval of a schedule of major State highway system improvement
21 projects to be undertaken by the Department under G.S. 143B-350(f)(4), the Board of
22 Transportation shall consider both:
23 (1) The impacts of global climate change as these affect the highway
24 system improvement projects.
25 (2) Whether and to what extent the projects would result in an increase or
26 decrease in greenhouse gas emissions."

PART IV. EFFECTIVE DATE

30 **SECTION 4.** This act becomes effective January 1, 2011, and applies to
31 planning and environmental review program activities subject to this act that occur on or
32 after that date.

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1 A HOUSE RESOLUTION REQUESTING THE PRESIDENT AND THE UNITED
2 STATES CONGRESS TO ADOPT LEGISLATION THAT PROMOTES JOBS AND
3 INNOVATIVE ENERGY DEVELOPMENT, STRENGTHENS NATIONAL ENERGY
4 AND ECONOMIC SECURITY, POSITIONS THE UNITED STATES TO BE AN
5 INTERNATIONAL LEADER IN THE FIELD OF CLEAN ENERGY, AND
6 ADDRESSES THE CONSEQUENCES OF CLIMATE CHANGE WITHOUT
7 PREEMPTING STATES' RIGHTS TO CONTROL EMISSIONS AND TO PROMOTE
8 RENEWABLE ENERGY, AS RECOMMENDED BY THE LEGISLATIVE
9 COMMISSION ON GLOBAL CLIMATE CHANGE.

10
11 Whereas, most of the world's climate scientists have concluded that greenhouse
12 gasses are causing the Earth's temperature to rise, resulting in global climate change; and

13 Whereas, in 2006 over twenty percent (20%) of the world's total energy-related
14 carbon dioxide was emitted by the United States, and eighty seven percent (87%) of
15 greenhouse gas emissions in the United States were related to fossil fuel combustion; and

16 Whereas, electricity generation and transportation are the two largest sources of
17 total greenhouse gas emissions in the United States and are responsible for approximately
18 thirty-nine percent (39%) and thirty-one percent (31%), respectively, of the nation's
19 greenhouse gas emissions from the combustion of fossil fuels; and

20 Whereas, high oil prices reduce the purchasing power of American consumers,
21 spur inflation, and boost the prices of basic goods and services; and

22 Whereas, the effects of unchecked climate change poses a threat to our nation's
23 economy, public health, environment, and national security; and

24 Whereas, potential impacts of climate change include variability of precipitation,
25 sea level rise, inundation of coastal communities, degradation of air quality, damage to
26 infrastructure, and loss of plant and animal species; and

27 Whereas, climate change will directly affect industries including tourism,
28 agriculture, forestry, fishing, and skiing, and will disproportionately affect communities
29 with limited resources to adapt and cope; and

30 Whereas, climate changes are already underway in the United States, are
31 projected to grow, and include increased variability in precipitation, rising temperature
32 and sea level, retreating glaciers, thawing permafrost, lengthening growing seasons,
33 lengthening ice-free seasons in the ocean and on lakes and rivers, earlier snowmelt, and
34 alterations in river flow; and

35 Whereas, climate change impacts will include increased heat, pests, water
36 stress, diseases, and weather extremes that will pose adaptation challenges for crop and
37 livestock production; and

38 Whereas, climate change will create health impacts related to heat stress,
39 waterborne diseases, poor air quality, extreme weather events, and diseases transmitted
40 by insects and rodents; and

41 Whereas, the effects of climate change include the increase of political and
42 social instability in poorer regions of the world, thus presenting potential security
43 challenges for the United States; and

44 Whereas, clean energy jobs are growing at a rate two hundred fifty percent
45 (250%) faster than the rest of the economy; and

1 Whereas, the United States Energy Information Administration projects clean
2 energy job growth of up to 2,000,000 new jobs resulting from comprehensive clean
3 energy legislation; and

4 Whereas, the generation of electricity through the use of renewable energy
5 presents opportunities to promote energy self-sufficiency, create jobs and economic
6 benefits, preserve natural resources, and improve the environment; and

7 Whereas, there is significant global competition for clean energy development
8 that could weaken the United States economy and threaten American innovation, without
9 comprehensive clean energy legislation; and

10 Whereas, thousands of businesses have joined together calling for
11 comprehensive federal clean energy legislation including, among others, members of the
12 United States Climate Action Partnership and the Clean Economy Network; and

13 Whereas, over the past two decades, in the absence of comprehensive federal
14 clean energy legislation, the states have been the true "laboratories of democracy" by
15 advancing clean energy policies; and

16 Whereas, many states have adopted renewable energy standards and goals that
17 require a significant percentage of a state's electricity to be generated from renewable
18 energy sources such as wind, solar, wave, hydropower and biomass and biofuels, which
19 sources have led to significant job growth in the clean energy sector of the national
20 economy; and

21 Whereas, state leadership has resulted in job growth and has reduced reliance
22 on imported energy sources, thus resulting in opportunities for renewed economic
23 development; and

24 Whereas, in 2002, the General Assembly enacted S.L. 2002-4, commonly
25 referred to as the Clean Smokestacks Act, that directed the public utilities in the State to
26 substantially reduce their emissions of traditional air pollutants and directed State
27 agencies to begin the process of identifying steps to reduce greenhouse gas emissions;
28 and

29 Whereas, in accordance with the Clean Smokestacks Act, the Division of Air
30 Quality of the North Carolina Department of Environment and Natural Resources has
31 completed studies and made recommendations regarding greenhouse gas emissions and
32 steps that can be taken to reduce emissions in the State; and

33 Whereas, in 2005, the General Assembly established the Legislative
34 Commission on Global Climate Change to study issues related to global climate change,
35 the emerging carbon economy, and whether it is appropriate and desirable for the State to
36 establish a greenhouse gas emissions pollutant reduction goal; and

37 Whereas, in 2007, the General Assembly established the first Renewable
38 Energy and Energy Efficiency Portfolio Standard (REPS) in the Southeastern United
39 States, in order to promote the development of renewable energy and energy efficiency in
40 the State; and

41 Whereas, in accordance with the REPS requirements, electric power providers
42 in the State must use an increasing percentage of renewable energy resources and employ

1 energy efficiency programs to meet a minimum of twelve and one-half percent (12.5%)
2 of the needs of the State's retail electricity customers by 2021; and

3 Whereas, in 2007, the General Assembly established the North Carolina Green
4 Business Fund to promote small businesses that develop and expand the biofuels
5 industry, the green building industry, clean technology, and renewable energy products
6 and businesses; and

7 Whereas, in 2009, the General Assembly established the Legislative Research
8 Commission Advisory Subcommittee on Offshore Energy Exploration to study issues
9 related to oil and natural gas exploration and development off the North Carolina coast,
10 as well as the potential impacts of alternative offshore energy projects on the nation's
11 energy supply, including energy generated from wind, waves, ocean currents, the sun,
12 and hydrogen production; and

13 Whereas, North Carolina has enacted, expanded, and renewed numerous tax
14 credits and incentive programs in order to promote the development and utilization of
15 renewable energy technologies and facilities in the State; and

16 Whereas, a national statutory framework for clean energy will provide a
17 predictable regulatory framework that will, provide better clarity for decision making,
18 and spur innovation in the clean energy sector; and

19 Whereas, without Congressional action, the United States Environmental
20 Protection Agency has announced their intention to regulate greenhouse gas emissions
21 through administrative rules rather than through legislation; and

22 Whereas, the United States House of Representatives passed the American
23 Clean Energy and Security Act (H.R. 2454) on June 26, 2009 on a bipartisan vote, and
24 bipartisan members of the United States Senate are currently considering and drafting the
25 Clean Energy Jobs and American Power Act (S. 1733); and

26 Whereas, the United States Congress has the opportunity to enact
27 comprehensive clean energy jobs and climate legislation that will strengthen our national
28 security, grow clean energy jobs, reduce pollution, and advance America; Now, therefore,
29

30 Be it resolved by the House of Representatives:
31

32 **SECTION 1.** The General Assembly urges the United States Congress to pass
33 and the President to sign comprehensive clean energy jobs and climate legislation that:
34 (1) creates a unified framework for reducing greenhouse gas emissions; (2) protects low
35 and moderate income Americans from increased energy costs, and invests substantially in
36 energy efficiency; (3) supports alternative sources of energy including but not limited to
37 wind, solar, wave, hydroelectricity, biofuels, advanced nuclear energy research, and clean
38 coal technologies; (4) acknowledges the carbon-intensive nature of the economy of the
39 United States and includes emissions offsets that protect energy consumers; and (5) does
40 not preempt state legislative efforts to control carbon emissions and to advance clean
41 energy innovations.

42 **SECTION 2.** The Secretary of State of North Carolina shall prepare and
43 transmit copies of this resolution to the President of the United States, the President and

1 the Secretary of the United States Senate, the Speaker and the Clerk of the United States
2 House of Representatives, and North Carolina's Senators and Representatives in
3 Congress.

4 **SECTION 3.** This resolution is effective upon ratification.

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APPENDIX A: AUTHORIZING LEGISLATION

GENERAL ASSEMBLY OF NORTH CAROLINA SESSION 2005

SESSION LAW 2005-442 SENATE BILL 1134

AN ACT TO ESTABLISH THE LEGISLATIVE COMMISSION ON GLOBAL CLIMATE CHANGE; TO DIRECT THE COMMISSION TO STUDY ISSUES RELATED TO GLOBAL WARMING, THE EMERGING CARBON ECONOMY, AND WHETHER IT IS APPROPRIATE AND DESIRABLE FOR THE STATE TO ESTABLISH A GLOBAL WARMING POLLUTANT REDUCTION GOAL; AND, IF THE COMMISSION DETERMINES THAT THE ESTABLISHMENT OF A GOAL IS APPROPRIATE AND DESIRABLE, TO AUTHORIZE THE COMMISSION TO DEVELOP A RECOMMENDED GOAL.

The General Assembly of North Carolina enacts:

SECTION 1. Commission Established; Membership. – The Legislative Commission on Global Climate Change is hereby established. The Commission shall consist of 34 members as follows:

- (1) Nine members appointed by the President Pro Tempore of the Senate.
- (2) Nine members appointed by the Speaker of the House of Representatives.
- (3) The President of Duke Power or the President's designee.
- (4) The President of Progress Energy or the President's designee.
- (5) The President of the North Carolina Citizens for Business and Industry or the President's designee.
- (6) The President of the Manufacturers and Chemical Industry Council of North Carolina or the President's designee.
- (7) The President of the North Carolina Farm Bureau Federation or the President's designee.
- (8) The President of the North Carolina Forestry Association or the President's designee.
- (9) The Southeast Regional Director of Environmental Defense or the Regional Director's designee.
- (10) The Executive Director of the Southern Alliance for Clean Energy or the Executive Director's designee.
- (11) The Executive Director of the North Carolina Coastal Federation or the Executive Director's designee.
- (12) The Executive Director of the North Carolina Conservation Council or the Executive Director's designee.
- (13) The Dean of the Nicholas School of the Environment and Earth Sciences, Duke University, or the Dean's designee.
- (14) The Dean of the College of Agriculture and Life Sciences at North Carolina State University or the Dean's designee.

- (15) The Dean of the School of Agriculture and Environmental Sciences at North Carolina Agricultural and Technical State University or the Dean's designee.
- (16) The Director of the Carolina Environmental Program at the University of North Carolina at Chapel Hill or the Director's designee.
- (17) The Distinguished Research Professor (with expertise in sea level change), Department of Geology at East Carolina University.
- (18) The North Carolina State Climatologist.

SECTION 2. Cochairs. – The Commission shall have two cochairs, one designated by the President Pro Tempore of the Senate and one designated by the Speaker of the House of Representatives from among their respective appointees. The Commission shall meet upon the call of the cochairs.

SECTION 3. Quorum. – A quorum of the Commission shall consist of 18 members.

SECTION 4. Vacancies. – Any vacancy on the Commission shall be filled by the original appointing authority.

SECTION 5. Purpose and Duties. – The Commission shall have the following purposes and duties:

- (1) The Commission shall conduct an in-depth examination of issues related to global climate change. This examination shall include all of the following:
 - a. A review of current scientific literature on the possible natural and anthropogenic causes of global climate change.
 - b. A review of actions taken by the federal government and by other states to address global warming.
 - c. An examination of the emissions of greenhouse gases from within the State and the extent to which reductions in the emissions of these gases in the State, region, nation, and worldwide could be expected to affect global climate change.
 - d. An evaluation of the economic opportunities for the State that may result from international, national, and State action to address global climate change and the emerging carbon market.
 - e. The potential impacts of global climate change on the citizens, natural resources, and economy of the State, including agriculture, travel and tourism, recreation, coastal real estate, insurance, and other economic sectors.
 - f. The costs of any action taken by the State to address global climate change on individuals, individual households, local governments, businesses, educational institutions, agricultural operations, the State government, and other institutions and economic sectors.
 - g. The benefits of any action taken by or within the State or other states and at the national or international levels to address global climate change on individuals, individual households, local governments, businesses, educational institutions, agricultural operations, the State government, and other institutions and economic sectors.
- (2) If, in the course of its examination, the Commission determines that it would be appropriate and desirable for the State to establish a global warming pollutant reduction goal, the Commission may develop a recommended global warming pollutant reduction goal for the State.
- (3) In conducting its examination of global climate change, the Commission shall consider and integrate the findings and recommendations of the study of issues related to the development and implementation of

standards and plans to control emissions of carbon dioxide required by Section 13 of S.L. 2002-4.

- (4) Based on its examination of global climate change, the Commission shall develop findings and recommendations, including any legislative proposals it determines to be appropriate, for consideration by the General Assembly.

SECTION 6. Additional Duties. – The Commission may work cooperatively with other state and national governments to organize a forum on global climate change, including its causes, impacts, challenges, and opportunities in the southeastern United States. The Commission may also work cooperatively with other State agencies with respect to the agencies' areas of responsibilities regarding greenhouse gas emissions and climate change.

SECTION 7. Expenses of Members. – Members of the Commission shall receive per diem, subsistence, and travel allowances in accordance with G.S. 120-3.1, 138-5, or 138-6, as appropriate.

SECTION 8. Staff. – Upon the prior approval of the Legislative Services Commission, the Legislative Services Officer shall assign professional staff to the Commission to aid in its work.

SECTION 9. Consultants. – The Commission may hire consultants to assist with the study as provided in G.S. 120-32.02(b).

SECTION 10. Meetings. – The Commission may meet in the Legislative Building or the Legislative Office Building upon the approval of the Legislative Services Commission.

SECTION 11. Report. – The Commission shall report its findings and recommendations to the General Assembly and the Environmental Review Commission on or before 1 November 2006, at which time the Commission shall terminate.

SECTION 12. Funding. – From funds appropriated to the General Assembly, the Legislative Services Commission shall allocate funds for the purpose of conducting the study provided for in this Part.

SECTION 13. Effective Date. – This act is effective when it becomes law.

In the General Assembly read three times and ratified this the 31st day of August, 2005.

s/ Beverly E. Perdue
President of the Senate

s/ James B. Black
Speaker of the House of Representatives

s/ Michael F. Easley
Governor

Approved 3:15 p.m. this 27th day of September, 2005

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**GENERAL ASSEMBLY OF NORTH CAROLINA
SESSION 2005**

**SESSION LAW 2006-73
SENATE BILL 1591**

AN ACT TO EXTEND THE LEGISLATIVE COMMISSION ON GLOBAL CLIMATE
CHANGE, AS RECOMMENDED BY THE ENVIRONMENTAL REVIEW
COMMISSION.

The General Assembly of North Carolina enacts:

SECTION 1. Section 11 of S.L. 2005-442 reads as rewritten:

"SECTION 11. Reports. – The Commission shall submit an interim report to the General Assembly and the Environmental Review Commission no later than 15 January 2007 and may submit interim reports at other times at its discretion. The Commission shall submit a final report, including any findings and recommendations, to the General Assembly and the Environmental Review Commission on or before 15 April 2008, at which time the Commission shall terminate."

SECTION 2. This act is effective when it becomes law.

In the General Assembly read three times and ratified this the 30th day of June, 2006.

s/ Beverly E. Perdue
President of the Senate

s/ Richard T. Morgan
Speaker Pro Tempore of the House of Representatives

s/ Michael F. Easley
Governor

Approved 3:00 p.m. this 10th day of July, 2006

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**GENERAL ASSEMBLY OF NORTH CAROLINA
SESSION 2007**

**SESSION LAW 2008-81
HOUSE BILL 2529**

AN ACT TO EXTEND THE LEGISLATIVE COMMISSION ON GLOBAL CLIMATE CHANGE, AS RECOMMENDED BY THE ENVIRONMENTAL REVIEW COMMISSION.

Whereas, the Legislative Commission on Global Climate Change was established by S.L. 2005-442 to conduct an in-depth examination of issues related to global climate change; and

Whereas, the Legislative Commission on Global Climate Change has met regularly since its inception in pursuit of its legislative charge; and

Whereas, the Legislative Commission on Global Climate Change needs additional time to carry out its legislative charge; Now, therefore,

The General Assembly of North Carolina enacts:

SECTION 1. Section 11 of S.L. 2005-442, as amended by S.L. 2006-73, reads as rewritten:

"**SECTION 11.** Reports. – The Commission may submit interim reports at its discretion. The Commission shall submit a final report, including any findings and recommendations, to the 2009 General Assembly and the Environmental Review Commission on or before 1 October 2009, at which time the Commission shall terminate."

SECTION 2. This act is effective when it becomes law.

In the General Assembly read three times and ratified this the 2nd day of July, 2008.

s/ Beverly E. Perdue
President of the Senate

s/ Joe Hackney
Speaker of the House of Representatives

s/ Michael F. Easley
Governor

Approved 12:03 P.M. this 11th day of July, 2008

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**GENERAL ASSEMBLY OF NORTH CAROLINA
SESSION 2009**

**SESSION LAW 2009-306
SENATE BILL 835**

AN ACT TO EXTEND THE LEGISLATIVE COMMISSION ON GLOBAL CLIMATE CHANGE.

Whereas, the Legislative Commission on Global Climate Change was established by S.L. 2005-442 to conduct an in-depth examination of issues related to global climate change; and

Whereas, the Legislative Commission on Global Climate Change has met regularly since its inception in pursuit of its legislative charge; and

Whereas, the Legislative Commission on Global Climate Change needs additional time to carry out its legislative charge; Now, therefore,

The General Assembly of North Carolina enacts:

SECTION 1. Section 11 of S.L. 2005-442, as amended by S.L. 2006-73 and S.L. 2008-81, reads as rewritten:

"**SECTION 11.** Reports. – The Commission may submit interim reports at its discretion. The Commission shall submit a final report, including any findings and recommendations, to the General Assembly and the Environmental Review Commission on or before October 1, 2010, at which time the Commission shall terminate."

SECTION 2. This act is effective when it becomes law.

In the General Assembly read three times and ratified this the 9th day of July, 2009.

s/ Walter H. Dalton
President of the Senate

s/ Joe Hackney
Speaker of the House of Representatives

s/ Beverly E. Perdue
Governor

Approved 5:21 p.m. this 17th day of July, 2009

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APPENDIX B: COMMISSION MEMBERSHIP

Session Law 2005-442, which established the Legislative Commission on Global Climate Change, provides that the Commission shall consist of 34 members. 18 of these members are appointed by the President Pro Tempore of the Senate and the Speaker of the House of Representatives as indicated below. The remaining 16 members are ex officio voting members designated as indicated on the second part of this membership list.

President Pro Tempore of the Senate Appointments⁷:

John L. W. Garrou, Co-Chair
P. O. Box 5958
Winston-Salem, NC 27113
(336) 245-2500
E-mail: johngarrou@yahoo.com

Senator Charlie Albertson
136 Henry Dunn Picket Road
Beulaville, NC 28518
(910) 298-4923
E-mail: Charlie.Albertson@ncleg.net

Senator Josh Stein
P.O. Box 10382
Raleigh, NC 27605
(919) 715-6400
Josh.Stein@ncleg.net

Senator Jim Jacumin
3690 Miller Bridge Road
Connelly Springs, NC 28612
(828) 397-3723
Jim.Jacumin@ncleg.net

Speaker of the House of Representatives Appointments⁸:

Representative Pricey Harrison, Co-Chair
P.O. Box 9339
Greensboro, NC 27429
(336) 292-1953
E-mail: Pricey.Harrison@ncleg.net

Representative Lucy Allen
312 North Main Street,
Louisburg, NC 27549
(919) 496-5111
Email: Lucy.Allen@ncleg.net

Representative Becky Carney
P.O. Box 32873
Charlotte, NC 28232
(704) 332-1893
E-mail: Becky.Carney@ncleg.net

Representative Alice Underhill
3910 Country Club Road
New Bern, NC 28562
(252) 633-2270
E-mail: Alice.Underhill@ncleg.net

Walter Clark, Deputy Director⁹

Representative W. A. “Winkie” Wilkins

⁷ Past appointments by the President Pro Tempore of the Senate include: former Senator Janet Cowell (2006-2008) and former Senator Robert Pittenger (2006-2008).

⁸ Past appointments by the Speaker of the House include: Speaker Joe Hackney who served as Commission Co-Chair from January 2006 to January 2007 and former Representative Wilma Sherrill (2006-2008).

Blue Ridge Rural Land Trust
Old Orchard Creek Farm
410 Swansie Shepherd Road
Lansing, NC 28643
(336) 384-2774
oldorchard@skybest.com

210 Fair Oaks Drive
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(336) 599-7336
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Honorable Charles C. Thomas
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Dr. Edward W. Erickson
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Raleigh, NC 27628
(919) 832-7601
E-mail: ncseapolicy@mindspring.com

Susan Tompkins
815 Hungerford Place
Charlotte, NC 28207
(704) 375-3276
E-mail: Susantompkins@carolina.rr.com

Ex Officio Members:

The President of Duke Power or the
President's designee

Dr. George T. Everett
Director of Environmental and Legislative Affairs
Duke Power
225 Hillsborough Place, Suite 160
Raleigh, NC 27603
(919) 235-0955
E-mail: gteverett@duke-energy.com

⁹ Walter Clark tendered his resignation from the Commission in 2009.

The President of Progress Energy or the President's Designee

Ms. Caroline Choi
Director – Energy Policy & Strategy
Progress Energy
410 South Wilmington Street, Suite 1505
Raleigh, NC 27601
(919)-546-3775
E-mail: caroline.choi@pgnmail.com

The President of the North Carolina Citizens for Business and Industry or the President's designee¹⁰

S. Lewis "Lew" Ebert
President and CEO
North Carolina Chamber
701 Corporate Center Dr., Suite 400
Raleigh, NC 27607
(919) 836-1410
E-mail: lebert@nccbi.org

The President of the Manufacturers and Chemical Industry Council of North Carolina or the President's designee

A. Preston Howard, Jr.
President
Manufacturers and Chemical Industry of North Carolina (MCIC)
620 N. West Street, Suite 101
Raleigh, NC 27603
(919) 834-9459
E-mail: preston.howard@mcicnc.org

The President of the North Carolina Farm Bureau Federation or the President's designee

Mitchell A. "Mitch" Peele
Director of Public Policy
North Carolina Farm Bureau Federation
P.O. Box 27766
Raleigh, NC 27611
(919) 788-1004
E-mail: mitch-peelee@ncfb.net

The President of the North Carolina Forestry Association or the President's designee

Robert W. Slocum, Jr.
Executive Vice President
North Carolina Forestry Association
1600 Glenwood Avenue, Suite I
Raleigh, NC 27608
(919) 834-3943
E-mail: rhslocum@ncforestry.org

¹⁰ Mr. Barry Eveland represented the North Carolina Citizens for Business and Industry from January 2006 through August 2006.

The Southeast Regional Director of Environmental Defense or the Regional Director's designee¹¹

Michael S. Regan
Policy Manager, North Carolina Office
Environmental Defense
4000 Westchase Blvd., Suite 510
Raleigh, NC 27607
(919) 881-2917
E-mail: mregan@edf.org

The Executive Director of the Southern Alliance for Clean Energy or the Executive Director's designee

Stephen A. Smith, DVM
Executive Director
Southern Alliance for Clean Energy
29 North Market Street, Suite 604
Asheville, NC 28801
(865) 567-7429
E-mail: sasmith@cleanenergy.org

The Executive Director of the North Carolina Coastal Federation or the Executive Director's designee¹²

Todd Miller
Executive Director
North Carolina Coastal Federation
3609 Highway 24 (Ocean)
Newport, NC 28570
(252) 393-8185
E-mail: toddm@nccoast.org

The Executive Director of the North Carolina Conservation Council or the Executive Director's designee¹³

Daniel E. Crawford
Director of Governmental Relations
Conservation Council of North Carolina
112 S. Blount Street
Raleigh, NC 27601
(919) 839-0020
E-mail: dan@conservationcouncilnc.org

The Dean of the Nicholas School of the Environment and Earth Sciences, Duke University, or the Dean's designee¹⁴

Todd Wooten
Director, Southeast Climate Resource Center
Nicholas Institute for Environmental Policy Solutions
Duke University
Durham, NC 27708
(919) 613-8701
E-mail: tw78@duke.edu

¹¹ Michael Shore served as the Environmental Defense designee from January 2006 through January 2009.

¹² Jim Stephenson served as the designee from the North Carolina Coastal Federation from January 2006 through January 2009.

¹³ Michael Nelson served as the designee from the Conservation Council of North Carolina from January 2006 through January 2009.

¹⁴ Tim Profeta served as the designee from the Nicholas School of the Environment at Duke University from January 2006 through March 2010.

The Dean of the College of Agriculture and Life Sciences at North Carolina State University or the Dean's designee

Dr. Daniel J. Phaneuf
Associate Professor of Agriculture and Resource Economics
Box 8109
North Carolina State University
Raleigh, NC 27695
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The Dean of the School of Agriculture and Environmental Sciences at North Carolina Agricultural and Technical State University or the Dean's designee

Dr. Godfrey A. Uzochukwu
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The Director of the Carolina Environmental Program at the University of North Carolina at Chapel Hill or the Director's designee¹⁵

Dr. Richard N. L. "Pete" Andrews
Chair, Department of Public Policy
University of North Carolina at Chapel Hill
202A Abernethy Hall, CB# 3435
Chapel Hill, NC 27599-3435
(919) 843-5011
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The Distinguished Research Professor (with expertise in sea level change), Department of Geology at East Carolina University

Dr. Stanley R. Riggs
Distinguished Research Professor
Department of Geology, College of Arts and Sciences
East Carolina University
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Greenville, NC 27858
(252) 328-6015
E-mail: riggss@ecu.edu

The North Carolina State Climatologist¹⁶

Dr. Ryan Boyles
Director and State Climatologist
Research III Building, Centennial Campus
Box 7236, North Carolina State University
Raleigh, NC 27695-7236
(919) 513-2816
Email: ryan_boyles@ncsu.edu

¹⁵ Dr. Doug Cranford-Brown served as the designee from UNC Chapel Hill from January 2006 to December 2007.

¹⁶ Dr. Sethu Raman, the State Climatologist from January 2006 through July 1, 2006, served as a member of the Commission.

Commission Staff¹⁷

Jeff Hudson, Commission Counsel
Jennifer McGinnis, Commission Counsel
Jennifer Mundt, Commission Analyst
Tim Dodge, Commission Counsel
Mariah Matheson, Commission Assistant

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Thelma Utley, Commission Clerk
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300 North Salisbury Street
Raleigh, NC 27603
(919) 733-5775

Ted Harrison, Commission Clerk
2125 Legislative Building
16 West Jones Street
Raleigh, NC 27601
(919) 733-5649

¹⁷ George Givens served as Commission Counsel from 2006 to 2009. The Commission Cochairs and Staff would like to thank Mr. Givens and the following people who contributed to the work of the Commission over the course of its investigation: Mary Watson, Genie Clark, Jessica Proctor, and Deladier Miller.

APPENDIX C: COMMISSION AGENDAS

February 3, 2006

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Introduction to, and discussion of, the state of the science related to global climate change
 - William H. Schlesinger, Dean, Nicholas School of Environmental & Earth Sciences, Duke University, James B. Duke Professor of Biogeochemistry
- Remarks regarding ongoing efforts by the Department of Environment and Natural Resources (DENR) to control emissions of carbon dioxide and other greenhouse gases
 - William G. Ross, Jr., Secretary of Environment and Natural Resources
- Final report on issues related to the development and implementation of standards and plans to implement programs to control emissions of carbon dioxide from coal-fired generating units and other stationary sources of air pollution (S.L. 2002-4, Sec. 13)
 - Brock M. Nicholson, Deputy Director, Division of Air Quality, DENR
- Report on specific activities and plans of the Division of Air Quality of the Department of Environment and Natural Resources to develop and implement standards and plans to control emissions of carbon dioxide and other greenhouse gases
 - Brock M. Nicholson, Deputy Director, Division of Air Quality, DENR

March 7, 2006

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Continuation of the discussion of the state of the science related to global climate change
 - Robert C. Balling, Jr., Professor, Department of Geography, Arizona State University
 - Stanley R. Riggs, Distinguished Research Professor, Department of Geology, College of Arts and Sciences, East Carolina University
 - Robert B. Jackson, Jr., Faculty Director, Center on Global Change; Professor of Biology and Environmental Sciences, Duke University
 - Sethu Raman, State Climatologist and Professor of Meteorology, Department of Marine, Earth, and Atmospheric Sciences, North Carolina State University
- Update on activities of the Department of Environment and Natural Resources (DENR) and the Climate Action Plan Advisory Group

- Brock M. Nicholson, Deputy Director, Division of Air Quality, DENR

April 4, 2006

Handouts and presentations from the Commission meetings are available online at:

<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Update on activities of the Department of Environment and Natural Resources (DENR) and the Climate Action Plan Advisory Group
 - B. Keith Overcash, Director, Division of Air Quality, DENR
- Discussion of the state of the science related to global climate change
 - David R. Easterling, Chief, Scientific Services Division, National Climatic Data Center, National Oceanic and Atmospheric Administration (NOAA) Asheville, North Carolina
 - Patrick J. Michaels, Research Professor and State Climatologist, Virginia State Climatology Office, University of Virginia, Charlottesville, Virginia
 - William L. Chameides, Chief Scientist, Environmental Defense, New York, New York
 - Michael C. MacCracken, Chief Scientist for Climate Change Programs, Climate Institute, Washington, D.C.
- Discussion of activities taken by businesses in the State and the United States to address global climate change
 - Truman T. Semans, Director for Markets and Business Strategy, Pew Center on Global Climate Change, Washington, D.C.
 - Robert L. Kee, Senior Vice President, Document Management, Bank of America, Charlotte, North Carolina
 - William F. Bailey, Principal Consultant, DuPont, Charlotte, North Carolina
 - Thomas Darden, Chief Executive Officer, Cherokee Investment Partners, Raleigh, NC

April 25, 2006

Handouts and presentations from the Commission meetings are available online at:

<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Discussion of the technology options related to global climate change by sector
 - Transportation sector
 - David L. Greene, Corporate Fellow, Oak Ridge National Laboratory, Knoxville, Tennessee
 - Electricity sector
 - Edward S. Rubin, Director, Center for Energy and Environmental Studies, Department of Engineering and Public Policy, Carnegie Mellon University, Pittsburgh, Pennsylvania
 - Construction and building sector

- Marilyn A. Brown, Interim Director, Engineering Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee
- Forestry and agriculture sector
 - Dennis W. Hazel, Professor, Forestry and Environmental Outreach Program, North Carolina State University, Raleigh, North Carolina
- Update on activities of the Department of Environment and Natural Resources (DENR) and the Climate Action Plan Advisory Group (CAPAG)
 - Brock M. Nicholson, Deputy Director, Division of Air Quality, DENR
 - Karl Hausker, Senior Advisor, Center for Climate Strategies, Harrisburg, Pennsylvania
- Discussion of the economic implications of climate change policy
 - The costs of climate policy options
 - Joseph E. Aldy, Fellow, Resources for the Future, Washington, D.C.
 - The costs of inaction,
 - John C. Whitehead, Associate Professor, Department of Economics, Appalachian State University, Boone, North Carolina
 - Economic implications for forestry and agriculture (DEFERRED)
 - Brian C. Murray, Director for Economic Analysis, Nicholas Institute for Environmental Policy Solutions, Duke University, Durham, North Carolina
 - Economic questions regarding climate change
 - Margo Thorning, Vice President and Chief Economist, American Council for Capital Formation, Washington, D.C.
 -
 - Costs and benefits of climate policy options (DEFERRED)
 - Karl Hausker, Senior Advisor, Center for Climate Strategies, Harrisburg, Pennsylvania

October 3, 2006

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Report on actions taken or under consideration by other states to address global climate change
 - Joshua Bushinsky, State Solutions Fellow, Pew Center on Global Climate Change
- Update on the study by the Utilities Commission of a renewable energy portfolio standard
 - James Y. Kerr II, Commissioner, North Carolina Utilities Commission

- Report on the proposal by the Public Staff of the North Carolina Utilities Commission to create a public benefits fund
 - Robert Gruber, Executive Director, Public Staff, North Carolina Utilities Commission
- Update on and discussion of activities of the Climate Action Plan Advisory Group (CAPAG)
 - Brock M. Nicholson, Deputy Director, Division of Air Quality, Department of Environment and Natural Resources
- Technical Working Group Updates and Discussion:
 - Agriculture, Forestry, and Waste
 - Mitchell A. “Mitch” Peele
 - Energy Supply
 - Tim Toben and George T. Everett
 - Residential, Commercial, and Industrial
 - Michael Shore
 - Transportation and Land Use
 - Michael Shore
 - Cross-Cutting Issues
 - Stephen A. Smith
- Next Steps for the Climate Action Plan Advisory Group (CAPAG)
 - Tom Peterson, Executive Director, The Center for Climate Strategies

November 27, 2006

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Update on activities of the Climate Action Plan Advisory Group (CAPAG) of the Department of Environment and Natural Resources (DENR) to develop and implement standards and plans to control emissions of carbon dioxide and other greenhouse gases
 - Brock M. Nicholson, Deputy Director, Division of Air Quality, Department of Environment and Natural Resources
- Discussion of the Northeast Regional Greenhouse Gas Initiative (RGGI)
 - Franz T. Litz, Climate Change Policy Coordinator, New York State Department of Environmental Conservation
- Discussion of the options for production and use of biofuels in North Carolina
 - Kurt S. Creamer, P.E., Biomass Program Manager, North Carolina Solar Center and Animal and Poultry Waste Management Center, North Carolina State University

- Overview of recent reports on the economic impacts of climate change
 - Stern Review Report on the Economics of Climate Change, Her Majesty's Treasury, United Kingdom
 - Impacts on U.S. Energy Expenditures of Increasing Renewable Energy Use, RAND Corporation
 - Tim Toben, Member, Legislative Commission on Global Climate Change and Chief Executive Officer of Carolina Green Energy Corporation

December 11, 2006

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- The investment policy of North Carolina as it relates to global climate change
 - Richard H. Moore, State Treasurer, North Carolina
- Discussion of the Chicago Climate Exchange's greenhouse gas emission registry and reduction and trading system for greenhouse gases, including a discussion of the benefits to North Carolina agriculture of methane capture offsets at animal operations
 - Michael J. Walsh, Senior Vice President, Chicago Climate Exchange
- Discussion of combined heat and power (CHP) as a method of reducing greenhouse gas emissions and increasing energy efficiency
 - Thomas R. Casten, Founder and Chair, Alliance for Clean Technology and founder and former Chief Executive Officer of Trigen Energy and Primary Energy Ventures
 - Raymond E. DuBose, Director, Energy Services Department, University of North Carolina at Chapel Hill
- Perspectives on global climate change from the faith community of North Carolina
 - Michael H. Cogsdale, President, North Carolina Council of Churches and Rector at St. James Episcopal Church in Lenoir, North Carolina

January 12, 2007

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Discussion of the effects of global climate change as they relate to coastal adaptation
 - Discussion of coastal vulnerability to erosion, storm hazards, and potential sea-level rise
 - S. Jeffress Williams, Coastal Marine Geologist, United States Geological Survey, Woods Hole Science Center

- Presentation of the National Academy of Sciences report Mitigating Shore Erosion along Sheltered Coasts
 - Debra Hernandez, President, Hernandez and Company
- Discussion of the projected impacts of global climate change on coastal ecosystems in North Carolina
 - Douglas N. Rader, Principal Scientist for Oceans and Estuaries, Environmental Defense
- Discussion of the implications of sea level rise for coastal development policy
 - Courtney T. Hackney, Chair, Coastal Resources Commission
 - Walter Clark, Coastal Community and Policy Specialist, North Carolina Sea Grant
- Report on the study by the North Carolina Utilities Commission of a Renewable Energy Portfolio Standard (REPS) for the State of North Carolina and related issues
 - James Y. Kerr II, Commissioner, North Carolina Utilities Commission
 - Sam Watson, Staff Attorney, North Carolina Utilities Commission
- Update on and discussion of activities and possible recommendations of the Climate Action Plan Advisory Group (CAPAG)
 - Brock M. Nicholson, Deputy Director, Division of Air Quality, Department of Environment and Natural Resources
 - Tom Peterson, Executive Director, The Center for Climate Strategies
- Proposed recommendations for inclusion in the Interim Report from members of the Commission
 - Stanley R. Riggs, James H. Stephenson, and Walter Clark
 - Dolores "Dee" Eggers
 - Timothy Profeta
 - Michael Shore

October 23, 2007

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Report on actions taken by other governmental units in the nation related to global climate change during the past year
 - Patrick Hogan, Solutions Fellow, Pew Center on Global Climate Change
- Discussion of legislation enacted by the 2007 Regular Session of the General Assembly to provide for a renewable energy portfolio standard (REPS) for the State (Promote Renewable Energy/Baseload Generation, S.L. 2007-397 (Senate Bill 3))
 - George F. Givens, Commission Counsel

- Discussion of recommendations considered by the Climate Action Plan Advisory Group (CAPAG) at its meeting on 16 October 2007
 - Brock M. Nicholson, Deputy Director, Division of Air Quality, Department of Environment and Natural Resources
 - Tom Peterson, Executive Director, Center for Climate Strategies
- Presentation of draft preliminary results of a macroeconomic analysis conducted on various climate mitigation options recommended by CAPAG
 - David W. Ponder, Graduate Research Assistant, Department of Political Science/Criminal Justice, College of Arts and Sciences, Appalachian State University

December 4, 2007

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Update on federal activities related to global climate change
 - Timothy Profeta, Director, Nicholas Institute for Environmental Policy Solutions, Duke University
- Discussion of the extent to which carbon offsets may be reliably identified and quantified
 - William L. Chameides, Dean, Nicholas School of the Environment, Duke University
- Discussion of opportunities for, and recommendations related to, carbon offset projects in the agriculture and forestry sectors
 - William C. McDow III, Southern Forest Projects Manager, Environmental Defense
- Presentation and consideration of the recommendations of the Agriculture, Forestry, and Waste Technical Working Group of the Climate Action Plan Advisory Group (CAPAG)
 - Brock M. Nicholson, Deputy Director, Division of Air Quality, Department of Environment and Natural Resources (DENR)
 - Thomas D. Peterson, President and CEO, Center for Climate Strategies
 - Stephen Roe, Senior Scientist, E.H. Pechan and Associates and Facilitator Agriculture, Forestry, and Waste Management Technical Work Group and Lead Consultant for Emissions Inventory, Center for Climate Strategies
 - Dennis W. Hazel, Assistant Professor and Extension Specialist, Department of Forestry and Environmental Resources, NCSU
 - Christopher B. Hopkins, Outreach Associate, Department of Forestry and Environmental Resources NCSU
 - M. Paul Sherman, Director of Air Quality and Energy Programs, North Carolina Farm Bureau Federation
 - Robert W. Slocum, Jr., Executive Vice President North Carolina Forestry Association

January 16, 2008

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

Discussion of strategies to mitigate and adapt to global climate change

- Emissions reduction goals and standards in the state of Maryland
 - George S. "Tad" Aburn Jr., Director, Air and Radiation Management Administration, Maryland Department of the Environment
- Adaptation to the effects of climate change in the state of Maryland
 - Kenneth A. Colburn, Senior Consultant, Center for Climate Strategies
 - Bill Dougherty, Senior Scientist, Center for Climate Strategies
- Report on progress in consolidation of the recommendations of the Climate Action Plan Advisory Group (CAPAG)
 - Thomas D. Peterson, President and CEO, Center for Climate Strategies
- Presentation of the report: "Measuring the Impacts of Climate Change on North Carolina Coastal Resources" prepared for the National Commission on Energy Policy
 - Christopher F. Dumas, Associate Professor, University of North Carolina at Wilmington
- Presentation of the report: "When it Rains, it Pours: Global Warming and the Rising Frequency of Extreme Precipitation in the United States" prepared by Environment America
 - Travis Madsen, Policy Analyst, Frontier Group, Environment North Carolina
- Preparation for the 11 February 2008 meeting of the Commission: Summary of the "Synthesis Report from Climate Change 2007" prepared by the Intergovernmental Panel on Climate Change (IPCC)
 - Dolores M. "Dee" Eggers, Commission member and Associate Professor, Department of Environmental Studies, University of North Carolina at Asheville

February 11, 2008

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

Presentation on the state of the science on global climate change, what developing countries are doing to address climate change in relation to what the United States and other industrialized countries are doing and should do in this regard, and what the State of North Carolina should do with regard to climate change

- Introduction of Dr. Pachauri
 - George F. Givens, Commission Counsel

- Presentation
 - Dr. Rajendra Pachauri, Chair, Intergovernmental Panel on Climate Change, and Director General, The Energy and Resources Institute

March 5, 2008

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Presentation of the recommendations of the Climate Action Plan Advisory Group (CAPAG) (Consolidated format)
 - Thomas D. Peterson, President and CEO, Center for Climate Strategies
- Presentation of options for State and local governments to consider with regard to plans for and adaptation to the impacts of global climate change
 - William E. Holman, Visiting Senior Fellow, Duke University Nicholas Institute for Environment Policy Solutions
- Presentation of the "North Carolina Green Cities Plan" by the Centers for Environmental and Climatic Interaction
 - Mack B. Pearsall, Advisory Board Member, Centers for Environmental and Climatic Interaction

April 22, 2008

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Presentation of the results of the Intergovernmental Panel on Climate Change in the context of creating a greenhouse gas emissions reduction goal for the State of North Carolina
 - Robert B. Jackson, Faculty Director, Center on Global Change, and Professor of Biology and Environmental Sciences, Duke University
- Presentation on electricity technologies in a carbon-constrained world
 - Bryan Hannegan, Vice President of Environment and Generation, Electric Power Research Institute
- Presentation of final results of the macroeconomic analysis conducted on various climate mitigation options recommended by Climate Action Plan Advisory Group (CAPAG)
 - David W. Ponder, Graduate Research Assistant, Department of Political Science/Criminal Justice, College of Arts and Sciences, Appalachian State University
- Presentation on the economics of climate change legislation in North Carolina

- David G. Tuerck, Executive Director, Beacon Hill Institute for Public Policy Research, and Professor and Chairperson, Economics Department, Suffolk University

November 14, 2008

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Overview of various reports on climate change issued by the National Conference of State Legislators
 - Glen Andersen, Program Principal, National Conference of State Legislators, Environment, Energy, and Transportation Program
- Discussion of four key action areas related to climate change (energy efficiency, clean energy, pollution capture, and long-range planning), discussed in the publication “Cornerstones,” issued by the Southern Alliance for Clean Energy
 - John D. Wilson, Research Director, Southern Alliance for Clean Energy
- Discussion of global warming adaptation strategies to conserve fish and wildlife habitats and maintain healthy and genetically diverse wildlife populations
 - Michael R. Bryant, Project Leader, North Carolina Coastal Plain Refuges Complex, Alligator River National Wildlife Refuge
- Presentation on estuarine shoreline erosion and coastal hazards in the changing climate of North Carolina
 - Dr. D. Reide Corbett, Ph.D., Associate Professor and Assistant Chair
 - Dr. J.P. Walsh, Ph.D., Assistant Professor, East Carolina University

December 9, 2008

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Discussion of green jobs in North Carolina
 - Paul J. Quinlan, Director, Economic Research and Development, North Carolina Sustainable Energy Association
- Discussion of green buildings and green building codes
 - R. Christopher Mathis, President, MC2 Mathis Consulting Company
- Brief discussion on anticipated federal actions on energy and climate change
 - Timothy H. Profeta, Director, Nicholas Institute for Environmental Policy Solutions, Duke University

- Discussion of adaptation strategies for rural and conservation lands and waters
 - Sam H. Pearsall, Southeast Regional Manager for Land, Water, and Wildlife, Environmental Defense Fund
- Presentation of the report "North Carolina Coasts in Crisis: A Vision for the Future"
 - Stephen J. Culver, Professor and Department Chairperson
 - David J. Mallinson, Associate Professor, Department of Geological Sciences, East Carolina University

January 13, 2009

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Presentation of the report "New Climate World: Integrating State and Regional Programs into an Emerging Federal System for Greenhouse Gas Regulation"
 - Robert B. McKinstry, Senior Advisor, Center for Climate Strategies
- Presentation of "Greenhouse Gas (GHG) Emission Reductions Between California GHG Standards and Federal Corporate Average Fuel Economy (CAFE) Standards" (S.L. 2008-181, Sec. 6.2)
 - Janice L. Godfrey, Environmental Engineer, Division of Air Quality, DENR
- Discussion of whether to set a goal to reduce State greenhouse gas emissions
- Discussion of whether to establish a permanent global climate change commission and Global Climate Change Advisory Council
 - Dr. Dolores M. Eggers, Assistant Professor, University of North Carolina at Asheville
 - Michael S. Regan, Policy Manager, Environmental Defense Fund
- Discussion of whether to establish energy efficiency standards for buildings constructed with State funds
- Discussion of whether and how to amend the State Building Code in order increase the energy efficiency of buildings constructed or substantially renovated in the State
- Discussion of adaptation recommendations
 - James H. Stephenson, Policy Director, North Carolina Coastal Federation
- Discussion of recycled energy and combined heat and power recommendations
 - Stephen A. Smith, Executive Director, Southern Alliance for Clean Energy

November 17, 2009

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Report on recent federal actions related to climate change
 - Victor Flatt, Tom & Elizabeth Taft Distinguished Professor of Environmental Law, School of Law, University of North Carolina at Chapel Hill
- Report on recent actions taken by state and local governments to address climate change
 - Thomas Peterson, President, Center for Climate Strategies
- Report on legislation related to climate change that was enacted during the 2009 Regular Session or is pending for the 2010 Regular Session
 - Jennifer Mundt, Commission Analyst

January 13, 2010

Handouts and presentations from the Commission meetings are available online at:
<http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=14>.

- Update on federal and international actions related to climate change, including the activities and outcomes of the 15th Conference of the Parties to the United Nations Framework Convention on Climate Change in Copenhagen, Denmark
 - Victor Flatt, Tom & Elizabeth Taft Distinguished Professor of Environmental Law, School of Law, University of North Carolina Chapel Hill
- Report on the implementation of the North Carolina Renewable Energy and Energy Efficiency Portfolio Standards and subsequent proceedings (S.L. 2007-397; Senate Bill 3)
 - Edward S. Finley, Jr., Chairman, North Carolina Utilities Commission
- Report on the activities and objectives of the Energy Policy Council
 - Tim Toben, Chair, North Carolina Energy Policy Council
- Report on Progress Energy's plans to retire eleven coal-fired electric generating units in North Carolina by 2017
 - Caroline Choi, Director - Energy Policy & Strategy, Progress Energy
- Report on climate initiatives within the Department of Environment and Natural Resources; Update on the activities of the Interagency Leadership Team with regard to climate change
 - David W. Knight, Assistant Secretary for Natural Resources, DENR
- Report on the Division of Emergency Management's development of a statewide risk assessment of sea-level rise and changes in storm frequency and intensity associated with climate change in coastal North Carolina (DEFERRED)
 - John Dorman, Assistant Director, Division of Emergency Management, Department of Crime Control and Public Safety

APPENDIX D: LETTER FROM CERTAIN COMMISSION MEMBERS IN RESPONSE TO SOLICITATION FOR RECOMMENDATIONS

February 5, 2010

Representative Pricey Harrison
Co-Chair, Legislative Commission on Global Climate Change
PO Box 9339
Greensboro, NC 27429

John L. W. Garrou
Co-Chair, Legislative Commission on Global Climate Change
PO Box 5958
Winston-Salem, NC 27113

Re: Proposals and Recommendations for the Legislative Commission on Global Climate Change

You requested additional proposals and recommendations for reducing greenhouse gases in North Carolina. As members of the Legislative Commission on Global Climate Change (LCGCC), we believe it is important to keep in mind the recommendations already adopted and the work already accomplished or in process. We need to evaluate the benefits and impacts of these extensive actions before recommending additional mandates.

As a group, we believe that there is great value in being more energy efficient, reducing our environmental footprint, and becoming more energy independent. By continuing our efforts to achieve these goals there will be the added benefit of reducing, avoiding, or sequestering greenhouse gas emissions. Our focus should be on these messages rather than continuing to debate the rates and causes of global warming.

In 2007, the LCGCC adopted a number of recommendations for inclusion in its interim report. The bulk of the adopted recommendations were compiled and unanimously recommended by the Climate Action Plan Advisory Group (CAPAG). While a Commission-approved interim report was never published, the adopted recommendations were noted in the summary provided by Commission Counsel Tim Dodge at the most recent meeting of the LCGCC. Almost all the LCGCC recommendations - and many of the CAPAG recommendations - have been implemented at some level, and the framework for the others is in place, although not fully funded (this is not unexpected, given the current economy).

For example, the General Assembly enacted S.L. 2007-307, a renewable energy portfolio standard (REPS; LCGCC recommendation #14). Enactment of this legislation implemented the mitigation option identified by CAPAG as having the greatest impact on reducing greenhouse gas emissions. North Carolina was the first state in the southeast to adopt such legislation and adjacent states have yet to follow our lead. The General Assembly also approved S.L. 2007-546. This language promotes the conservation of energy and water use in state, university and community college buildings (LCGCC recommendation #2). The Center for Climate Strategies, in coordination with the Department of Environment and Natural Resources, completed a statewide inventory and forecast of greenhouse gas emissions (LCGCC Recommendation #10).

According to the Greenhouse Gas Inventory and Forecast, North Carolina's greenhouse gas emissions on a per capita basis and per unit of gross product were below the national average. These lower-than-national-average emissions of greenhouse gas emissions in the state (due in part to our significant nuclear generation capacity) are in spite of the extensive use of air conditioning in our geographical area and our position as a major manufacturing state. Even though North Carolina has been doing better than the national average in terms of greenhouse gas emissions, the significant steps taken by the General Assembly further improve our status. Thus, we believe that while North Carolina is in good company nationally in terms of our efforts to control greenhouse gas emissions, we are leaders in our region where the competition for jobs and growth is intense.

Additional notable actions that will address many of the other recommendations made by the CAPAG include the adoption of:

- anti-idling rules by the North Carolina Environmental Management Commission (TLU-8);
- tax incentives for renewable energy facilities and targets for specific renewable energy resources (ES-1, ES-3);
- statutory changes to facilitate siting of renewable energy facilities, (ES-9);
- tax incentives for biofuels production and establishment of a biodiesel production goal (TLU-6);
- federal standards for small generator interconnections as well as improvements to the net metering rules by the North Carolina Utilities Commission (ES-3, ES-9, LCGCC recommendation #9); and
- a mandatory greenhouse gas emissions reporting protocol by the US EPA (CC-2).

Of the top ten mitigation options identified by the CAPAG that would achieve the greatest reductions in greenhouse gas emissions, eight of the ten have been implemented or have the mechanisms in place but await sufficient funding.

Until the full benefits of the existing actions have been achieved and all of the recommendations already adopted have been adequately funded, more recommendations are unnecessary. We need to evaluate the benefits and impacts of the actions already taken before more mandates are adopted. As an example, the first comprehensive renewable energy targets under Senate Bill 3 will only come into play in 2012 (set aside target for solar in 2010).

North Carolina is demonstrating strong leadership in reducing greenhouse gas emissions. This Commission, along with the legislative and executive branches, has created a substantial body of work and put significant long-term initiatives in motion. Our state is dealing with the worst recession in a generation and facing record unemployment levels. As state leaders and employers work together to create more jobs, we believe that now is not the time to recommend additional mandates on our economy but to evaluate where we stand and to ensure the effectiveness of what is under way.

Thank you for your consideration of our views.

Sincerely,

Thomas F. Cecich

Caroline Choi, Progress Energy

S. Lewis (Lew)Ebert, North Carolina Chamber

George T. Everett, Duke Energy Carolinas

A. Preston Howard, Jr., Manufacturers and Chemical Industry Council

Mitchell A. (Mitch) Peele, North Carolina Farm Bureau Federation

Robert W. Slocum, Jr., North Carolina Forestry Association

cc: Mariah Matheson, Commission Assistant

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DRAFT

APPENDIX E: SUMMARY OF ACTIONS ON CAPAG RECOMMENDATIONS:

Mitigation Option Name		CAPAG Level of Support		Approved By LCGCC	Cumulative GHG Reductions 2007–2020 MMtCO ₂ e	Implementation Status
		Unanimous Consent	Supermajority Consent			
	Residential, Commercial, and Industrial (RCI)					
RCI–1	Demand Side Management Programs for the RCI Sectors - Recommended Case: "Top-Ten States" EE Investment	Yes		No	77.1	Session Law 2007-397, SB 3: Renewable Energy and Energy Efficiency Portfolio Standard (REPS) Energy Policy Council - Energy Efficiency Subcommittee
RCI–2	Expand Energy Efficiency Funds	Yes		Yes	54.8	Energy Policy Council - Energy Efficiency Subcommittee Session Law 2007-397, SB 3: Renewable Energy and Energy Efficiency Portfolio Standard (REPS) Session Law 2007-381, SB 581: Bldg. Permit Fee Reductions/Rebates...
RCI–3	Energy Efficiency Requirements for Government Buildings	Yes		Yes	6.4	Session Law 2007-546, SB 668: Energy Conservation in State Buildings
RCI–4	Market Transformation and Technology Development Programs	Yes		Yes	10.5	
RCI–5	Improved Appliance and Equipment Efficiency Standards	Yes		Yes	5.3	Energy Policy Council - Energy Efficiency Subcommittee
RCI–6	Building Energy Codes	Yes		Yes	23.1	Energy Policy Council - Energy Efficiency Subcommittee Session Law 2008-203, SB 1947-HB2532: Codify Energy Efficiency in Public Buildings

Mitigation Option Name		CAPAG Level of Support		Approved By LCGCC	Cumulative GHG Reductions 2007–2020 MMtCO ₂ e	Implementation Status
		Unanimous Consent	Supermajority Consent			
	Residential, Commercial, and Industrial (RCI)					
RCI–7	“Beyond Code” Building Design Incentives and Targets, Incorporating Local Building Materials and Advanced Construction	Yes		Yes	34.2	Session Law 2007-381, SB 851: Building Permit Fee Reductions/Rebates to Promote Energy Efficient Building Construction Energy Policy Council - Energy Efficiency Subcommittee
RCI–8	Education (Consumer, Primary/Secondary, Post-Secondary/ Specialist, College and University Programs)	Yes		Yes	Not Applicable (NA)	
RCI–9	Green Power Purchasing (required for state facilities) and Bulk Purchasing Programs for Energy Efficiency or Other Equipment	Yes			3.5	
RCI–10	Distributed Renewable and Clean Fossil Fuel Power Generation	Yes			33.5	Session Law 2007-397, SB 3: Renewable Energy and Energy Efficiency Portfolio Standard (REPS)
RCI–11	Residential, Commercial, and Industrial Energy and Emissions Technical Assistance and Recommended Measure Implementation	Yes		Yes	14.9	
	SECTOR TOTAL AFTER ADJUSTING FOR OVERLAPS				218.7	

Table prepared by the Division of Air Quality of DENR, last updated March 3, 2010. Please refer to the CAPAG final report at: <http://www.ncclimatechange.us/capag.cfm> for a full description of each of the CAPAG mitigation options.

Mitigation Option Name		CAPAG Level of Support		Approved By LCGCC	Cumulative GHG Reductions 2007–2020 MMtCO ₂ e	Implementation Status
		Unanimous Consent	Supermajority Consent			
	Energy Supply (ES)					
ES-1	Renewable Energy Incentives	Yes			0.33	Session Law 2007-397, SB 3: Renewable Energy and Energy Efficiency Portfolio Standard (REPS) Session Law 2009-548, HB 512: Incentives for Energy Conservation Session Law 2009-553, HB 1387: Solar Collectors on Residential Properties
ES-2	Environmental Portfolio Standard					
ES-2a	Original Analysis	Yes			288.7	
ES-2b	20% Combined Target	Yes			166.2	
ES-2c	Load Growth Offset Target	Yes			160.3	
ES-3	Removing Barriers to Combined Heat and Power and Clean Distributed Generation	Yes		Yes	20.1	Session Law 2007-397, SB 3: Renewable Energy and Energy Efficiency Portfolio Standard (REPS) Energy Policy Council - Energy Efficiency Subcommittee
ES-4	CO ₂ Tax and/or Cap-and-Trade					
ES-4a	Electric Sector Only		Yes		20.4	
ES-4b	Economy-wide		Yes		47.7	
ES-5	Legislative Changes to Address Environmental and Other factors	Yes			NA	
ES-6	Incentives for Advanced Coal					Energy Policy Council - Energy Supply Subcommittee
ES-6a	Replacement of New 800 MW Pulverized Coal Plant	Yes			31.0	Session Law 2009-390, SB 1004: Amend Certain Electricity Generation Laws
ES-6b	Replacement of Existing 800 MW Pulverized Coal Plant	Yes			42.9	Progress Energy Carolinas plans to retire select unscrubbed coal plants in N.C.

Mitigation Option Name		CAPAG Level of Support		Approved By LCGCC	Cumulative GHG Reductions 2007–2020 MMtCO ₂ e	Implementation Status
		Unanimous Consent	Supermajority Consent			
	Energy Supply (ES)					
ES-7	Public Benefit Charge		Yes		24.4	
ES-8	Waste to Energy	Yes			0.02	Session Law 2007-397, SB 3: Renewable Energy and Energy Efficiency Portfolio Standard (REPS) Energy Policy Council - Energy Supply Subcommittee
ES-9	Incentives for Combined Heat and Power and Clean Distributed Generation	Yes		Yes	NA	Energy Policy Council - Energy Supply Subcommittee Session Law 2009-522, HB 1389: Revolving Loan Fund For Energy Improvements
ES-10	NC GreenPower Renewable Resources Program	Yes			0.95	
	SECTOR TOTAL AFTER ADJUSTING FOR OVERLAPS				375	
	REDUCTIONS FROM RECENT ACTIONS (None)				0	
	SECTOR TOTAL PLUS RECENT ACTIONS				375	

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Mitigation Option Name		CAPAG Level of Support		Approved By LCGCC	Cumulative GHG Reductions 2007–2020 MMtCO ₂ e	Implementation Status
		Unanimous Consent	Supermajority Consent			
	Transportation and Land Use (TLU)					
TLU-1a	Land Development Planning		Yes		58.2	Energy Policy Council – Low Carbon Transportation Subcommittee Session Law 2009-95, SB 52: Various Localities Energy Development Incentives DENR is coordinating a Land Use Planning and Development Working Group
TLU-1b	Multi-Modal Transportation and Promotion (formerly TLU-2)	Yes			52.4	Energy Policy Council – Low Carbon Transportation Subcommittee
TLU-3a	Surcharges to Raise Revenue		Yes		15.7	
TLU-3b	Rebates/ Feebates to Change Fleet Mix		Yes		2.8	
TLU-4	Truckstop Electrification	Yes			NA	
TLU-5	Tailpipe GHG Standards		Yes		44.5	Proposed Federal Rule: Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards for Model Years 2011 – 2016
TLU-6	Biofuels Bundle	Yes			35.4	Energy Policy Council – Low Carbon Transportation Subcommittee
TLU-7	Procure Efficient Fleets	Yes			NA	Energy Policy Council – Low Carbon Transportation Subcommittee Session Law 2009-241, HB 1079 – Energy Efficient State Motor Vehicle Fleet
TLU-8	Idle Reduction/Elimination Policies	Yes			2.2	Energy Policy Council – Low Carbon Transportation Subcommittee Division of Air Quality Rule Awaiting Legislative Review - Heavy-Duty Vehicle Idling Restrictions (15A NCAC 02D 1010)
Mitigation Option Name		CAPAG Level of Support		Approved	Cumulative	Implementation Status

		Unanimous Consent	Supermajority Consent			
	Transportation and Land Use (TLU)					
TLU-9	Diesel Retrofits	Yes			13.5	Session Law 2007 – 420, SB 1277: State diesel vehicles, Warrantees/B20 Fuel
TLU-11	Pay-As-You Drive Insurance		Yes		42.0	
TLU-12	Advanced Technology Incentives	Yes			NA	
TLU-13	Buses – Clean Fuels	Yes			NA	Session Law 2007 – 423, SB 1452: Diesel School Buses to Use Minimum B20
	SECTOR TOTAL AFTER ADJUSTING FOR OVERLAPS				232.3	
	REDUCTIONS FROM RECENT ACTIONS (None)				0	
	SECTOR TOTAL PLUS RECENT ACTIONS				232.3	

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Mitigation Option Name		CAPAG Level of Support		Approved By LCGCC	Cumulative GHG Reductions 2007–2020 MMtCO ₂ e	Implementation Status
		Unanimous Consent	Supermajority Consent			
	Agriculture, Forestry, and Waste (AFW)					
AFW-1	Manure Digesters & Energy Utilization	Yes			6.4	Session Law 2007-397, SB 3: Renewable Energy and Energy Efficiency Portfolio Standard (REPS) Session Law 2007, SB 1465: Methane Capture Pilot Program
AFW-2	Biodiesel Production (incentives for feedstocks and production plants)	Yes			5.1	Session Law 2007-206, SBI 2051 and HB 1990: Establish the Biofuels Center of NC/Funds
AFW-3	Soil Carbon Management (including organic prod. methods incentives)	Yes			3.0	
AFW-4a	Preservation of Working Land–Agricultural Land	Yes			2.6	
AFW-4b	Preservation of Working Land–Forest Land (formerly AFW-7)	Yes			36	
AFW-5	Agricultural Biomass Feedstocks for Electricity or Steam Production	Yes			0.2	
AFW-6	Policies to Promote Ethanol Production	Yes			38	Clean Transportation Program Clean Fuel Advanced Technology 2006-09, NC Solar Center/NCSU Session Law 2005-276, State Fleet Petroleum Displacement Plan Requirement Various North Carolina Alternative Fuel Incentives
AFW-8	Afforestation and/or Restoration of Nonforested Lands	Yes			15	
AFW-9&10	Expanded Use of Forest Biomass and Better Forest Management	Yes			48	
AFW-11	Landfill Methane and Biogas Energy Programs	Yes			20	Session Law 2007-397, SB 3: Renewable Energy and Energy Efficiency Portfolio Standard (REPS)

Mitigation Option Name		CAPAG Level of Support		Approved By LCGCC	Cumulative GHG Reductions 2007–2020 MMtCO ₂ e	Implementation Status
		Unanimous Consent	Supermajority Consent			
	Agriculture, Forestry, and Waste (AFW)					
AFW-12	Increased Recycling Infrastructure and Collection	Yes			4.1	
AFW-13	Urban Forestry Measures	Yes			34	
	SECTOR TOTAL AFTER ADJUSTING FOR OVERLAPS				213	
	REDUCTIONS FROM RECENT ACTIONS (None)				0	
	SECTOR TOTAL PLUS RECENT ACTIONS				213	

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Mitigation Option Name		CAPAG Level of Support		Approved By LCGCC	Cumulative GHG Reductions 2007–2020 MMtCO ₂ e	Implementation Status
		Unanimous Consent	Supermajority Consent			
	Cross-Cutting Issues (CC)					
CC-1	GHG Inventories and Forecasts	Yes		Yes	NA	Division of Air Quality Developing State Specific Emissions Inventory Projection Tool DENR is coordinating a Carbon Mitigation Working Group
CC-2	GHG Reporting	Yes		Yes	NA	EPA EHG Mandatory Reporting Rule for Facilities Emitting Greater Than 25,000 metric tons CO ₂ e per year
CC-3	GHG Registry	Yes		Yes	NA	DENR Serves as state board member and reporter of department's carbon footprint.
CC-4	Public Education and Outreach	Yes		Yes	NA	DENR led efforts for workshops, information tools, and other resources related to climate change mitigation and adaptation
CC-5	Adaptation	Yes		Yes	NA	DENR is leading state effort to develop a Climate Action Plan for NC DENR is coordinating a Sea Level Rise Working Group
CC-6	Options for Goals or Targets (for CAPAG in support of LCGCC)	Yes		Yes	NA	

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