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Minutes

LEGISLATIVE COMMISSION ON GLOBAL CLIMATE CHANGE

Tuesday 3 October 2006

10:00 a.m.

Room 643, Legislative Office Building

The Legislative Commission on Global Climate Change met on Tuesday 3 October 2006 at 10:00 a.m. in Room 643 of the Legislative Office Building with Representative Joe Hackney, Co-Chair, presiding. Other members present were Mr. John Garrou, Co-Chair, Senators Cowell, Pittenger, and Representative Harrison. Other members present were Dr. Ryan Boyles, Dr. Douglas Crawford-Brown, Mr. Walter Clark, Dr. Dolores Eggers, Dr. Edward W. Erickson, Dr. George Everett, Mr. Robert Glaser, Mr. Michael Nelson, Mr. Mitchell Peele, Mr. Tim Profeta, Dr. Stanley Riggs, Mr. Michael Shore, Mr. Robert Slocum, Dr. Stephen Smith, D.V.M., Mr. James Stephenson, Mr. Tim Toben, Mr. Ivan Urlaub, Ms. Susan Tompkins, Dr. Godfrey Uzochukwu and Ms. Vicky Will. Staff members present were George Givens, Commission Counsel, Jeff Hudson, Commission Counsel, Jennifer McGinnis, Commission Counsel, Jennifer Mundt, Research Analyst, Thelma Utley, Commission Clerk and Mary Watson, Commission Clerk.

A copy of the meeting notice for this meeting, a copy of the agenda and the visitor's registration are attached to these minutes as Exhibits **A, B, and C**.

Representative Hackney opened the meeting, welcomed the newest members of the Commission, and asked them to introduce themselves. The President's designee from Progress Energy, Ms. Vicky Will, said she became the Director of Environmental Services in April and prior to that was the plant manager of the Cape Fear plant in Chatham County. The President's designee for the Citizens for Business and Industry is Lewis "Lew" Ebert, who was not present today, and the new State Climatologist, Dr. Ryan Boyles, replacing Dr. Sethu Raman who recently retired, said he has been with the State Climate office as a graduate student and then as a scientist since 1997 and was appointed State Climatologist, effective September 1, 2006.

Representative Hackney called on Mr. Givens for his remarks and to explain the agenda. Mr. Givens welcomed guests and asked them sign the visitor's registration. He also reminded members to sign their reimbursement sheets and return them to the clerks.

Mr. Givens noted that a copy of Senate Bill 1591 extending the legislative Commission on Global Climate Change and a copy of a list of recommended speakers for the Commission had been placed on each member's desk. These handouts are listed as **Exhibit D**.

Mr. Givens also announced a change in the Environmental staff. Tim Dodge, Commission Analyst, was recently accepted to law school at UNC-Chapel Hill and

has been replaced by Jennifer R. F. Mundt. An additional Research Assistant is in the process of being hired.

Mr. Givens said that a revised roster had been distributed reflecting all of the Commission members and staff changes. He asked members to make sure that all of their information was correct. A copy of the new member roster is attached as **Exhibit E**.

Mr. Joshua Bushinsky, State Solutions Fellow, Pew Center on Global Climate Change, gave a report on actions taken or under consideration by other states to address global climate change. A copy of his slide presentation is listed as **Exhibit F**.

Mr. Bushinsky said that one of the things he works on is to track and analyze actions across the country and work closely with commissions such as this one as well as state officials to help inform climate policy based on the best available science, economics and the lessons learned from other government entities that have begun to address climate change.

Mr. Bushinsky said he would focus on recent state actions, of the most interest to the Commission, that have occurred over the past six months and to give some background on how some state, national and other entities have begun to set targets for greenhouse gas emission reductions.

Mr. Bushinsky said that the pace of policy development and diffusion with regard to state action over the past year and a half has increased rapidly. States are acting for a variety of reasons. There are concerns about impacts from climate change, changes in weather patterns that will cause droughts, wildfires, increases in intensities of storms and damage to tourism, industry, to water resources, etc.

Mr. Bushinsky said they had also seen concerns about economic development, both hedging against impacts to the economics of the state as well as looking for opportunities for how to address climate change in ways that improve the states' economy and provide robust opportunities for innovation and export of technologies and strategies to address climate change.

Mr. Bushinsky said that part of the motivation is dealing with price volatility for energy resources which drive a number of states to adopt policies. Energy dependence is another concern as well as addressing greenhouse gas emissions in the context of other air quality concerns. Traffic congestion and other policy goals have been drivers for policies that are reducing greenhouse gas emissions in states and cities across the country today.

Mr. Bushinsky said that what has changed over the year is that states are beginning to act on climate change because they are realizing that to act on climate change is to get ahead of the regulatory curve. There is an increasing consensus that, over the next three to five years, the federal government is likely to address climate change in a comprehensive and mandatory way. And, the result of that policy may be that there are states that are winners and states that are losers. There are industries that will win and industries that will have to try harder to address these policy concerns. What states are realizing is the earlier they act on climate change the earlier they can

offer incentives for their state industries and entrepreneurs to develop the technologies and policies that will address climate change. They will be able to export to the growing market for these technologies the solution those other states and other nations are already demanding.

Mr. Bushinsky said there is action across the country on policies from energy, transportation, agriculture and forestry, directly addressing greenhouse gas emissions and indirectly addressing greenhouse gas emissions in order to achieve other policy goals. Legislatures and governors are acting and there is a bottom up drive for policy innovation from citizens who are realizing that the impacts to their states and opportunities that climate change creates for their economies and there is top down recognition from high place government and elected officials that this is a problem they need to address, now. States are not acting to drive federal policy but they believe in doing what they are doing.

Mr. Bushinsky said that the Regional Greenhouse Gas Initiative (RGGI), a program to cap and trade carbon dioxide emissions from power plants, in a set of New England and Mid-Atlantic states has made an enormous amount of progress over the last six months. The RGGI will stabilize emissions at current levels from 2009 to 2015 and reduce emissions of carbon dioxide by 10 percent from power plants by the year 2019. In August, the group of states developing this program has put together a model rule that each state would have to adopt individually, either through legislation or regulation. This will form a market for carbon dioxide reduction from power plants as well as incentivizing opportunities to reduce emissions outside of the power sector and sell those emission reductions to power plants that find it more cost effective to reduce their emissions.

Mr. Bushinsky said that Maryland, which was not one of the states originally part of this program or its development, passed a bill in April 2006 to compel the state to join this program. The legislators in Maryland saw that addressing climate change and carbon dioxide emissions as part of a broader strategy to reduce the environmental impacts of their power sector. This is the first state outside of the program that has joined and there is possibility of other states joining this market to achieve the lowest cost emission reductions from their power plants.

Mr. Bushinsky said that California recently passed legislation, AB32, Global Warming Solutions Act of 2006. Fran Pavely, an assembly member, introduced the California vehicles legislation passed in 2004. Eleven states are now poised to follow those rules. She also introduced a bill to set into law the cap that Governor Swartzeneger had proposed last summer. After seeing the amazing amount of attention that this the clean vehicle legislation garnered, the Speaker of the Assembly became the co-sponsor and lead sponsor of this bill and pushed through an agreement with the Governor in August 2006. What this bill does is set into law the Governor's target of establishing an executive order to achieve 1990 levels of greenhouse gas emissions by 2020. That is essentially equal to about a 25 percent reduction in greenhouse gas emissions compared to business as usual. This is the first enforceable statewide program to cap industrial greenhouse gas emissions. It not only covers power plants but also a variety of sectors and there will be opportunities across the state to reduce emissions to achieve this target. It leaves a lot up to the regulatory process.

Mr. Bushinsky said that one of the key parts of this legislation (AB32) is that it authorizes the implementation of market based mechanisms such as the cap and trade mechanism used in the RGGI that allows different entities to either reduce their own emissions beyond their targets and sell those to other entities or for entities to buy emission allowances to achieve their targets as opposed to making reductions within their own business.

Mr. Bushinsky said that California has been extremely active on this issue and have put together an electricity performance standard which sets a standard on both in-state electricity generation and on out of state imports of electricity generation in terms of the environmental attributes that this electricity has. They have also upped their renewable portfolio standard now slated to achieve 20 percent of its electricity by 2010. This is an ambitious goal but one that is in line with what many other states have done. There are now 22 states, plus the District of Columbia, that have such renewable portfolio standards that mandate a certain percentage of electricity generated from renewable sources.

Mr. Bushinsky said there are continuing efforts in California, including the vehicle greenhouse gas standards and a number of other initiatives including a carbon adder, that compels utilities to think about the impacts of their investment in terms of greenhouse gas emissions over the lifetime of the plants and contracts that they sign for and build. The public utilities commission is also developing a cap on greenhouse gas emissions that will be dovetailed into the efforts by the legislature to cap greenhouse gas emissions. This is another good example of policy diffusion that the states have the ability to either follow federal or California standards for vehicle emissions. The California standard is currently being challenged. If it survives legal challenge, there are 11 states poised to adopt this standard, which is over 30 percent of the new vehicle market.

Mr. Bushinsky said that a huge issue for states over the last six or eight months has been gasoline prices. In response to the developing market for alternative fuels, 10 states over the past six months have adopted either standards or incentives for renewable fuels. This has been an explosion over the last six months and achieves a number of policy goals. It helps states hedge against volatile energy crisis, it achieves a measure of energy independence for states and for the nation instead of importing oil or producing vehicle fuels at home using crops grown in the United States, and it has environmental benefits. If this is done right greenhouse gas emissions can be reduced substantially. But, the caveat is that if you make the ethanol using corn, you get less of a benefit than if you use cellulosic ethanol produced from the woody biomass from plants. That provides more in the way of greenhouse gas benefits. Brazil has been very successful in doing this with sugar cane.

Mr. Bushinsky said that this Commission is one of a number of commissions that are actively working on climate change across the country. Over the last year, there have been a number of states that have begun to consider their options to mitigate the impacts of climate change, to find economic opportunities to address climate change, and to figure out how to export those solutions to other states and profit by doing so.

Mr. Bushinsky said that Arizona recently came out with an emissions profile, which is not a state that is traditionally led on environmental policy initiatives. Fossil fuels are part of their economic strategy. They are also concerned about impacts from climate change in terms of drought, heat waves, wildfires and water resources. There has been enormous growth in this state over the last 10 years and is projected to continue. The growth in the state has driven greenhouse gas emissions and ambitious targets to achieve reduction in greenhouse emissions will need to come while they are still growing.

Mr. Bushinsky said that, after the report of the Governor's Advisory Commission in Arizona, an executive order was issued that set ambitious goals for the state in reducing greenhouse gas emissions to 2000 levels by 2020 and a 50 percent reduction below 2000 levels by 2040. The elements of this plan are diverse. There are 47 recommended actions and they cover the breadth of the economy.

Mr. Bushinsky said that this brings us now to 12 states with targets for greenhouse gas emissions. He referenced the handout showing the state and regional targets for greenhouse gas emissions as well as proposed federal targets and targets adopted by other countries. He noted that the targets adopted by other countries are targets that those countries are actually working towards today. The federal legislation is all proposed. This gives a good sense of what the range of targets are and what people think is possible.

Mr. Bushinsky said that states generally tend to have a variety of emission targets. A short term target to compel action today and to serve as a metric for success are reductions in line with what scientists believe are necessary to avoid dangerous climactic change; 80 percent by 2050 is what California has adopted and a 2040 target for Arizona. While the magnitude of that reduction may seem overwhelming; the important part is taking the first step. The sooner that states begin to address global climate change, the less costly and easier it is for states to achieve those goals. And, it will help them move into working under a federal system that many people anticipate will come into a fact within the next five or ten years, depending on how optimistic or pessimistic people are.

Mr. Bushinsky said that the short term targets, as in the Arizona process and in many other processes, come from looking at what is achievable today, using strategies that have been adopted elsewhere and using technologies that are on the shelf today. Companies have done similar things in setting their own targets. A number of examples include BP, which achieved early and at profit their greenhouse gas reduction targets. DuPont was the same story and Entergy has also met its goal to stabilize carbon dioxide emissions from their U.S. generation at 2000 levels by 2006. And, there are also opportunities in sectors you would not normally think of. IBM has reduced its carbon emissions from its semi-conductor manufacturing process significantly. These are in many cases a cost saving to these companies.

Mr. Bushinsky said that companies also have longer term aspirational goals. Forty percent reduction in greenhouse gas emissions by 2020 is similar to those longer term aspirational goals that many states have adopted.

Mr. Bushinsky said it is helpful to look at what has been done elsewhere. The target sheet shows what other people in reasoned and considered processes have thought

are appropriate and achievable for their states, countries and companies. What is important is defining a baseline. There is a difference between returning to a given level versus projecting your business as usual emission reductions. It is important to think what sort of growth is expected and what sort of opportunities are anticipated. Many of the options that exist for greenhouse gas emissions can achieve other policy goals. It is important to think about the cost, the co-benefits and how you can achieve other policy goals to reduce greenhouse gas emissions. Many states and companies have done this, and across the world people are developing technologies and strategies to do this.

Mr. Bushinsky continued by saying that within this country and across the world, we are seeing these emerging markets for greenhouse gas emission reductions and for clean energy. The RGGI is likely to be the first mandatory program that goes into effect in the U.S. California will likely follow closely behind. These are markets where people can participate and either reduces emission outside of the power sector and outside of the region and sells those emission reductions into that region given a set of constraints that has been set up by the state. This is a real opportunity that many innovators and entrepreneurs are starting to take advantage of.

Mr. Bushinsky said that based on a long research process, the Pew Center has found that the benefits from just incentivizing technology development and adoption or just setting caps on greenhouse gas emissions make the cost much higher than pursuing a two prong strategy to both push and pull emission reduction opportunities and strategies into the market. By both setting a clear cap that sends a price signal to the market and unleashes the power of the market as well as supporting those technologies that require to get through some hurdles to be brought to market, you can most effectively achieve reductions and similarly you can begin to create the industries lowest costs. If you put money on the table and show a clear incentive to do something, someone will find a better way to do it.

Mr. Bushinsky said there are a couple of emerging markets listed for renewable energy credits as well as for energy efficiency. In Oregon and Washington there is a standard to offset emission reductions from their power plant. This is reducing emissions outside of the power plant in order to offset the greenhouse gas emissions from those plants. There is a voluntary effort in the Chicago climate exchange where both business and government entities sign up and commit to a given amount of emission reductions under a legally binding contract. All of these markets are going to create a strong incentive for innovation. If you can set the conditions to do it in your own state and region, you can help get ahead of the curve that folks are anticipating at a federal level. You can get your businesses, industries and entrepreneurs to become the winners in this game as opposed to getting behind the curve and having to catch up once those regulations come down the pipe. Doing that early can help earn emission reduction credits under a federal program. There is a precedent for this in other market systems and can help create the conditions to move ahead of the curve and addressing a regulatory regime.

Mr. Bushinsky concluded by saying that the pace of action on climate change has steadily increased. The lessons that are available from other states are helpful in deciding how to effectively address greenhouse gas emissions. The targets provide certainty for companies, they provide a metric for success for government and enforced targets with penalties provide an incentive and propel the market forward

for greenhouse gas emissions and the technologies that are going to be necessary to achieve the clean energy future that we require and avoid the dangerous climactic change impacts that are coming down the pike if we don't act sooner as opposed to later.

Dr. Everett said, "North Carolina has passed some landmark legislation to address the emissions of NOx and SO2. One of the things that were an encouraging sign was, if steps were taken early, there would be some credit given in the future for actions. It wasn't long after the Clean Smokestacks Legislation passed that we had federal legislation that gave us targets that are even lower. And, now we can't use those credits we earned to meet the federal targets. So, when you suggest that maybe we will have this opportunity to use what we do now to address what might happen in federal legislation, it makes me nervous."

Mr. Bushinsky said he understands Dr. Everett's concern and the precedent that he was referring to was a program to address acid rain. It is certainly a possibility and what is important and what the Pew Center and other organizations that have studied this have found is that one of the important factors is actually state level lining of the federal government to make sure that those early reductions. And, in North Carolina's case with the Clean Smokestacks Act, there are fewer states to band together with and lobby for those. With greenhouse gas emission reductions, there are enough states that have already begun to take action that there is likely a sizeable lobbying effort that is a possibility.

Dr. Everett said that we would be able to trade in the federal program except we have a prohibition against doing that. He said, "The other thing that this suggests to me is the fundamental principle that was in the Clean Air Act always guided these activities around the state to avoid a situation where you create a shopping center attitude. For example, if you are a new industry and you are going to look for where you might put a new facility, the Clean Air Act gave us a set of federal standards by which no matter where you went there would not be an incentive for you to locate based on what you might have to meet in terms of an air quality standard so that the playing field was even. You would not decide to go to South Carolina because they had less stringent air regulations versus North Carolina. But, when we do these things on a patchwork basis, we do just that strange incentive to find the state with the climate that is the best for you to operate in. If you look at the map of states that have taken action and look at their utility rates, I think you will see what we are creating is that same patchwork opportunity."

Mr. Bushinsky said that Dr. Everett's point about a patchwork opportunity is absolutely correct and he thinks that the stated position at the Pew Center is that they much prefer federal policy to do this. The important issue is how the policies are developed and whether you can create both the push and pull for innovation.

Mr. Profeta said that in the Clean Air Act, credit for early action was written into it and the reason North Carolina didn't get it was because it didn't happen in the legislature, it happened in the administration. He said he was tracking every piece of federal legislation out there and every single one has a provision for credit for early action. There has been a registry in place, federally, since 1992 to allow those emission reductions to be tracked. So, it is an absolute important point that there is legislative action taken.

Mr. Profeta said that the point to be taken in Mr. Bushinsky's presentation is there are market opportunities that are available in North Carolina. In RTP we have a thriving biotech industry and we should be trying to grab that and create the right signals but not create a situation where people decide to locate outside of our borders. He would submit there is a sweet spot in between that we should be shooting for.

Dr. Everett agreed that there are certainly opportunities; we just need to be careful as we move forward. In fact, what kept us from participating in the federal trading program was not activity at the federal level but activity here in North Carolina.

Representative Hackney said it was a retirement of the credits.

Dr. Everett said that was correct but at that time there was no federal legislation.

Senator Cowell asked Mr. Bushinsky if he had information on the commercial consumer utility rates before and after actions were taken.

Mr. Bushinsky said that most of these actions are all anecdotal at this point. There really has not been any data collected yet; however, some of these renewable energy sources have come out winners under high gas prices and so forth. It is anticipated for most of the public utilities commissions that have approved them have done studies and work to mitigate rate impacts.

Senator Pittenger asked Mr. Bushinsky if he was aware of a letter sent by 60 climatologists to the Prime Minister in Canada regarding their commitment to Kyoto and their concerns regarding the implementation of Kyoto relative to the lack of significant effect in other countries and the fact that the cost related to it as well as the lack of science that these climatologists feel is not sufficient to support Kyoto is similar to the mandates the Pew Center is suggesting.

Mr. Bushinsky said he was not trying to tell North Carolina what mandates and goals to set. But, in regards to claims by a very small minority of sets of climate scientists, it has been made clear that both the science has strengthened over the last five years and the overwhelming consensus among climate scientists that the science is compelling and that action is required.

Mr. Peele asked Mr. Bushinsky about the need to get ahead of the curve and especially the regulatory curve at the federal level. He said that most of the examples in his presentation cite states that are taking legislative or regulatory action to mandate changes in action. He asked Mr. Bushinsky to give some more examples of voluntary things that states are doing other than the carbon credit trading program and some success that have had with that.

Mr. Bushinsky said that there are a variety of both voluntary and mandatory programs that states have adopted: renewable portfolio standards that have set mandatory standards, and likewise public benefit funds that have set aside funds from pay for renewable and energy efficiency improvements as well as a variety of voluntary actions taken to incentivize alternative fuels both here and in many other states to address smart growth and agricultural greenhouse gas emissions. What has been clear nationally and state by state is, while voluntary initiatives can help

drive some amount of action, mandatory emissions actually drive real reductions and help companies and states think more clearly about where the lowest cost emission reduction opportunities are in both of these voluntary incentives and mandatory policies to provide the cheapest way to achieve reductions. There are both federal and state level voluntary programs to reduce greenhouse gas emissions in the building sector and energy sector but it is not clear that these voluntary efforts have actually achieved more than real modest success for the most part. There have been some voluntary standards such as Energy Star which is an appliance efficiency standard that manufacturers can meet that have had a fair amount of success in reducing emissions from power.

Mr. Shore said that Dr. Everett's comments on federal and state standards brings up what he thinks is an opportunity for this Commission and an area where we can make a difference. There is a large acceptance that there will be federal standards to reduce global warming pollution. Duke Energy has called on the federal government to cap global warming pollution and we don't know how far that will be down the road. However, we in North Carolina have a great interest in what those federal standards look like to make sure that the business sector in our state can win in the standards that come down the pike. We need to make sure that our hog industry and agricultural and forestry industries have an opportunity to play well and participate in the carbon market place. So, food for thought for us as a Commission is how we figure out where we can make a difference of setting out principles or guidelines that we share with our Congressional delegation on what we think federal standards should look like so that North Carolina's economy can win and where we could chose to put some effort.

Mr. James Y. Kerr, II, Commissioner of the North Carolina Utilities Commission, gave an update on the study by the Utilities Commission of a renewable energy portfolio standard.

Mr. Kerr said he was asked by the Environmental Review Commission to present an update on the study being conducted by the Utilities Commission on the cost benefits of a renewable energy portfolio study. He said that both his presentation and Mr. Gruber's presentation are a good follow-up to Mr. Bushinsky's presentation.

Mr. Kerr said that he would talk about a more discrete effort the Utilities Commission has been funding and supervising in North Carolina to look at a renewable portfolio standard.

Mr. Kerr said there has been a growing interest in looking at renewable energy as a means of meeting the state's growing demand and hopefully having a less harmful impact on the environment. These resources have traditionally, in terms of their delivered cost, been viewed as more expensive than some of the traditional fossil fuel based generation technologies. So, when you think about renewable energy, one of the concerns is what the cost impact is on consumers.

Mr. Kerr said that a number of states have adopted a renewable portfolio standard which is to require a certain percentage of the generation provided and used in the state to come from various renewable technologies. North Carolina does not have a renewable portfolio standard. We do, however, have a voluntary green power program. It is the first voluntary state program in the country. All customers in the

state have the ability to voluntarily pay an additional amount of money each month on their electric bill to purchase blocks of renewable energy.

Mr. Kerr asked a show of hands for those who are signed up for green power. He said this has been a successful program and the state's initial step towards trying to support renewable energy. The logical step in the continuum would be to require a certain percentage of generation.

Mr. Kerr said that the ERC asked the Utilities Commission if they would fund and oversee the study on renewable portfolio standards. They agreed to do this with the goal of conducting a conclusive study that would involve and reflect the views and opinions of all of the relevant stakeholders.

Mr. Kerr said the goal of the study is not to make actual policy recommendations but rather to come up with an objective piece of analytical work to provide to the General Assembly that would be informative and useful as they wrestle with some of the actual policy decisions that are needed to be made.

Mr. Kerr said they also wanted to obtain the services of a national, high caliber and experienced consultant who had done this type of work before and who would work with the representatives of the stakeholders here in North Carolina to design and conduct and present the study when it is completed. Another goal is to complete the study before the General Assembly reconvenes in January 2007.

Mr. Kerr said that in February 2006, after receiving the request, they first formed the Renewable Portfolio Standards Advisory Group (RPSAG). Members of the GCCC who serve on the advisory panel are Dr. Erickson, Mr. Urlaub and Mr. Howard. He added that other members are Mitch Williams from Progress Energy, David Beam from the Co-ops, Chris Corocini from Environmental Defense, Sue Gucheau from North Carolina Solar Center, James McLawhorn representing the public staff, and Lynn Green representing the Attorney General's office.

Mr. Kerr said that one of the things they learned in the NC Green Power experience was that they were able to get folks with different viewpoints to work cooperatively through persuasion and by getting them in the room together to work through some of these issues.

Mr. Kerr said that the RPSAG is a group of folks representing the various stakeholder interests and perspectives who have come together to try to help design the RFP. They have a role in the selection of the consultant and to participate in the study and be the local executive committee that would answer questions, provide information, review preliminary results, review the draft final report and guide the process along. The study should benefit from that approach and they believe it will be a fair balanced prospective.

Mr. Kerr said that because the study involved the use of state funds, they had to go through the state's competitive bidding process and lost more weeks than anticipated by navigating purchase and contracting. The advisory group did develop the RFP and contacted 16 consultants who had experience and received five bids. After going through the bid evaluation process, LaCapria Associates, based in Boston, was selected. In July, LaCapria met with both the Commission and the RPSAG to

work on the design of the study. Fundamentally, what the study is designed to do is to discern the impact on electric rates as well as the broader impact on North Carolina's entire economy through the use of standard, widely accepted economic modeling tools. There has been some discussion about some of the additional benefits and costs that might be associated beyond electric rate impacts and the study is going to try to look at things like potential for job creation or offsetting negative impact on industrial rates.

Mr. Kerr said that one of the things that have developed in the course of designing the study was a collective desire on both the part of the Commission and the Advisory committee to look at energy efficiency. Energy efficiency is not classically a renewable energy resource, it is looking at methods that you can lessen and displace load but it obviously is a benign resource. This had not been an original part of the RFP; however, the group thought it should be part of the various scenarios that would be run. A lot of the data needed to do the modeling exists here either with the utilities or with the other load serving entities. Some work has been done at Appalachian State University at the State Energy Office. Some of their role was to hook the consultants up and point them in the right direction and help them access the information that they needed to do the economic modeling.

Mr. Kerr said that a draft report is anticipated in late October with a final report in November 2006. The goal is to meet that target to deliver the report to the General Assembly on December 1, 2006. One of the things they want to do is also provide the opportunity for the various stakeholders to comment on the report. They think it is important to allow stakeholders who are interested to comment on the report. The report will be put out for comment between December and January when the General Assembly convenes.

Mr. Kerr said that the goal is to provide some North Carolina specific objective high quality consultant driven expertise to the GCCC to help in making the kind of decisions they are confronted with.

Representative Harrison asked Mr. Kerr if, when considering costs for renewable energy and energy production, they are taking into account public health or environmental impacts.

Mr. Kerr said they are not taking these things into effect in this study. The study is designed to focus on the inputs of provision of electric service. He said he did not believe they are trying to quantify and calculate what the externalities would be.

Dr. Smith asked Mr. Kerr how many megawatts of generation there is in the RPS program and asked how that compares with what is being generated by the state.

Mr. Kerr said that as voluntary programs go, it is performing at a level that is comparable to other voluntary programs. It has struggled some because of a lack of money available for advertising and public awareness. Some money was obtained in that direction in approving the Duke Merger case. Voluntary programs do not displace the percentage of energy that a mandatory renewable portfolio standard would.

Mr. Kerr said what is interesting is how a voluntary program is necessary to see how many people are willing to pay out of their own pocket short of a policy making body telling people they have to do it.

Dr. Smith asked about energy efficiency and the investment in North Carolina.

Mr. Kerr opted not to answer Dr. Smith's question. He did say that North Carolina has enjoyed a situation of having lower than national average electricity rates through more traditional means. If you look at RPS or energy efficiency, it is harder to justify them on a cost basis, the lower your other traditional energy production methods are. What has changed is, as we look at the demand growth and we look at the need bring new generation online, the open question for all of us as policymakers about what makes sense going forward. For the last few years, we have enjoyed the cost benefits, as compared to other parts of the country, of the nuclear investments that we made historically. They were expensive to get in the ground. But once they are up and running they are, on a marginal basis, cheaper to run. Coal and gas are the same; however, there are higher commodity prices out there in the market and a need for new generation.

Dr. Smith asked Mr. Kerr if he was comfortable in talking about how the Commission is viewing the concept of carbon risk in utility investments and where they stand on this issue.

Mr. Kerr declined to discuss Dr. Smith's request; however, he said that as we look at investments you might make in traditional fossil fuel type generation, there is an effort in the integrated resource plans that are filed with the Utilities Commission in building new generation. The proponents of different types of generation have raised the question about how you discern the future cost of the choices you make given the uncertainty about carbon regulation. There is an effort made to model what the various scenarios would be. The question now is what we do going forward and what the carbon regulation environment is going to be and what that will cost. If we look at coal and somehow think there will be a carbon tax, this obviously will affect the cost analysis.

Mr. Shore encouraged everyone to sign up for Green Power. He also commended the Utility Commission for embarking on the RPS portfolio study and the process they are going through. It looks like a credible process. One of the results produced will be how different renewable energy sources or efficiency will impact rates and the total cost that North Carolinians pay for electricity.

Mr. Shore asked Mr. Kerr about carbon and what one of the results would be with regard to how much carbon emissions would be under various scenarios and add renewables to the grid. And, if not, would it be possible to give us carbon impacts as well.

Mr. Kerr asked Mr. Urlaub to answer this question.

Mr. Urlaub said that what he understands so far is that the advisory group has been tackling the components of the study and no decision has been made with reference to carbon.

Mr. Shore asked that this be included in the study.

Mr. Kerr said that in doing the modeling, what they are looking at is what a base case is, and what the availability of various resources is.

Mr. Robert Gruber, Executive Director, Public Staff, North Carolina Utilities Commission, gave a report on the proposal by the Public Staff of the North Carolina Utilities Commission to create a public benefits fund. A copy of Mr. Gruber's handout is listed as **Exhibit G**. Below are his comments in entirety.

The Public Utilities Act states that, in planning for future growth of reliable utility service, it is the policy of the State of North Carolina to "include use of the entire spectrum of demand-side options, including but not limited to conservation, load management and efficiency programs" so as to result in the "least cost mix of generation and demand reduction measure..."

The NCUC has been considering demand-side management (DSM) options along with supply-side options such as new power plants for over 20 years. During the late 1980s and early 1990s, activity before the Commission involving DSM was fairly vigorous, and there were major expenditures made by the utilities on DSM programs. However, during the later part of the 1990's DSM fell out of favor in NC and around the nation due to several factors:

1. Retail competition seemed imminent and there was a danger that utility expenditures for DSM would be stranded;
2. The need for expensive base load plants declined, and new natural gas plants were becoming less and less expensive;
3. Natural gas and coal costs declined;
4. Wholesale competition allowed utilities to make economical purchases of firm power from neighboring utilities; and
5. Rates in NC and the Southeast were low relative to other regions and this made it difficult for many DSM programs to "prove in."

As a result of the focus on competition and the accompanying de-emphasis of DSM, the NCUC streamlined its IRP rules and did not hold evidentiary hearings regarding resource planning for eight years. During the past few years, the energy environment has changed dramatically and the pendulum has swung back in DSM's favor. Retail competition has not developed as expected and many states, including NC, are no longer considering it. Rapid customer growth has created a need for new base load power plants, and coal and natural gas prices have risen dramatically, causing larger fuel cost adjustments.

In 2005 and early 2006 it became obvious to the NCUC that it needed to place demand-side management and renewable energy back on the "front burner" and it took several important steps.

1. The NCUC decided to conduct a study of the potential for a renewable portfolio standard (RPS) in North Carolina. This study would determine whether the utilities should be required to supply a

certain percentage of their power from renewable energy such as wind, solar and biomass. This study will assess the technical and the practical potential of renewables and the costs and benefits of an RPS.

2. The NCUC decided to hold an evidentiary hearing for the first time in eight years and set the following issues for hearing:
 - (a) The validity of utility forecasting methods;
 - (b) Whether the utilities are employing and developing adequate DSM and displacing the need for additional generation assets;
 - (c) The potential opportunities for cost-effective energy efficiency and conservation;
 - (d) The degree to which utility programs can effectively reduce consumption; and
 - (e) What funding mechanisms could be employed to implement specific energy efficiencies measures?

3. The NCUC decided that progress on certain issues could best be made in a collaborative setting rather than an adversarial hearing, and ordered the Public Staff to conduct a collaborative workshop on these issues and include all of the important stakeholders. The issues to be considered were the following:
 - (a). The criteria that the Commission should consider in deciding to approve a DSM program in the future;
 - (b) Whether the Commission Rules on IRP proceedings should be changed to allow for more expansive review of efficiency and conservation programs in future IRP proceedings.;
 - (c) Ratemaking issues, such as “decoupling” of sales from profits;
 - (d) Carbon regulation; and
 - (e) Renewable portfolio standards and public benefits funds.

The Commission stated that consideration of these issues by the workgroup could prove beneficial to the Commission in its efforts to remain adequately informed about important industry issues. It ordered the Public Staff to report back to it any agreement or consensus reached during the workshop.

The hearing on the utilities' 2005 Annual Resource Plans was held on June 27-28, 2006. Both Duke and PEC testified that they had 15 to 20 ongoing DSM programs. Duke testified that its programs had reduced 2005 peak demand by 722 MW, and PEC testified that its programs had reduced demand by 374 MW.

The NCUC issued an order on August 31, 2006, approving the 2005 integrated resource plans. The NCUC found that the utilities' forecasting methods were adequate and that “the utilities' development and deployment of DSM resources for the purpose of displacing the need for additional generation assets is adequate for the 2005 IRP, but may not be adequate for future proceedings.”

The Commission's Order required that future IRP filings by the utilities include a more comprehensive analysis of their DSM plans and activities, including cost/benefit

information, and required the utilities to cooperate with the Public Staff and other interveners in reviewing and designing programs.

During the hearing, the utilities and some of the environmental witness testified that utilities have a disincentive to develop and implement DSM programs, which increase annual utility expenditures and result in lower kWh sales. The utilities recommended that the Commission approve some form of rate recovery rider to allow timely recovery of their capital investments, operating and maintenance expenses, programs costs and any incentives paid to customers.

In its Order, the Commission reviewed the history of the funding of DSM programs and the ratemaking treatment of DSM costs and stated that “it is premature to settle on any particular funding mechanism or ratemaking treatment as a means of meeting the policy expressed in G.S. (62-2(3a).” With regard to lost revenue, the Commission stated that “special ratemaking treatment could be unnecessary if DSM efforts are to be administered by an independent third party statewide”, and that, “once the picture becomes clearer, additional steps can be taken to develop or refine any funding mechanisms and ratemaking treatment or to consider innovative funding options, such as a third party administrator of DSM efforts...”.

The collaborative workgroup facilitated by the Public Staff met on July 27, 2006, and considered the delegated issues, including whether a cost recovery mechanism should be adopted. Participants in the workgroup were the electric investor owned utilities (Duke, PEC, and Dominion NC Power), the cooperative utilities, the Attorney General, the North Carolina Sustainable Energy Association, Environmental Defense, Southern Environmental Law Center, the Southern Alliance for Clean Energy, the North Carolina Waste Awareness and Reduction Network, Inc., the North Carolina Advanced Energy Corporation, Carolina Utilities Customers Association, Inc., and the Carolina industrial Group for Fair Utility Rates.

On September 1, 2006, the Public Staff filed a report regarding the progress of the workshop. Just as they had at the evidentiary hearing, the Public Staff and the environmental groups again recognized that utilities have a financial disincentive to provide DSM programs. The North Carolina Sustainable Energy Association noted that having an independent third party administer DSM programs, rather than the utilities, prevents the need for special rate treatments to address the lost revenue problem. Vermont and Wisconsin’s energy efficiency programs, which use third party administrators, were discussed as potential models. Finally, there were concerns expressed by members of the work group that any cost recovery mechanism, such as a rider or surcharge, might not be permissible without legislation.

There was no consensus reached by the work group regarding whether it should recommend that a DSM cost recovery mechanism be recommended to the Commission. However, the Public Staff decided that cost recovery is critical to significant progress being made in the development and implementation of DSM by utilities and decided that it should recommend that the Commission consider the establishment of a Public Benefit Fund for statewide DSM programs that would be administered by an independent, non-utility third party. The Public Staff stated in the report that “[a] PBF totally avoids the disincentives that the utilities face when

considering DSM programs that reduce their sales.” It further stated that the Advanced Energy Corporation, which administers the Green Power program, appears to be a qualified third-party administrator and requested the Commission to solicit comments from Advanced Energy on how it would propose to manage a PBF and finance the development and implementation of DSM programs in the state.

The Public Staff believes that there is a legitimate question as to whether the Commission has the statutory authority to approve a cost recovery mechanism to collect for DSM program costs, including mechanisms that would be administered by either the utilities or a third party administrator. The Public Staff also believes a public benefits fund surcharge should be applicable to the municipals providing electric service and to the electric membership cooperatives, which is clearly beyond the Commission’s authority. The Public Staff does not at this time have a proposed draft of legislation authorizing such a cost recovery mechanism, but we would be willing to assist Legislative Staff in drafting an amendment to Chapter 62, if so directed.

Mr. Urlaub asked Mr. Gruber about the idea behind the public benefits fund and making funds available for energy efficiency. Is it possible to find out how the money is spent and could it be measured and help us avoid having to build base load generation power plants. Is it fair to say there is a potential tradeoff where energy efficiency is a supply side option?

Mr. Gruber said it could meet some base load need but, as you know, most of the discussion before the Commission about the potential utilities have to address their needs through Demand Side Management (DSM) is talking about the 200 megawatt range for each utility. Over the next five years, the coal plant at the Cliffside Unit, which Duke Energy has requested to be approved by the Commission, involved 1600 megawatts of capacity. The Utilities Commission does not see any way that even an aggressive DSM program could displace the need for that plant or even delay a plant that is required over the next five years. The same is going to come up if Progress Energy makes an application for a plant. DSM requires an effort by the utilities to spend money on the programs and also requires change in consumer behavior.

Mr. Brock M. Nicholson, Deputy Director, Division of Air Quality, Department of Environment and Natural Resources (DENR), gave an update on and discussion of activities of the Climate Action Plan Advisory Group (CAPAG). A copy of the report from the CAPAG and a copy of Mr. Nicholson’s slides are listed as **Exhibit H**.

Mr. Nicholson said he was glad to report that a lot of activity has been underway since the GCCC last met. Mr. Nicholson said that during his presentation there would be comments from GCCC members who are on CAPAG.

Mr. Nicholson said that Mr. Tom Peterson from Climate Change Strategies was present to assist in the presentation and discussion as needed.

Mr. Nicholson said there are 45 members on the Climate Action Plan Advisory Group (CAPAG). There are 11 members of the GCCC on CAPAG. And, on the technical workgroups, or TWGS, there are members on each of the five workgroups, 18 on residential, commercial and industrial, 18 on energy supply, 18 on transportation and

land use and 14 on crosscutting issues, those not necessary source type or source sector specific.

Mr. Nicholson said the first CAPAG meeting was held in February 2006 and the second and third in May and July. At the meeting in July, the group looked at those mitigation options that were to be chosen for the more detailed analysis. A meeting is scheduled for October 12, 2006 in Raleigh. The technical workgroups have had 41 meetings and forty more meeting are anticipated among the five groups between now and May 2007. Additional meetings of CAPAG are expected to number three or four, depending on the need.

Mr. Nicholson said that the purpose of the July meeting of CAPAG was to take what started out to be a large number of potential options; 251 listed in Center for Climate Strategies catalog for state options. Looking across all of the states that have been involved in similar activities, there a number of groups included from our Clean Smokestacks Act and State Energy Plan. In addition, 307 mitigation options were considered for reducing greenhouse gases. A process was gone through with each of the technical workgroups to consider this whole range of options and a vote was taken to decide those 52 options the group felt were the most worthy of more cost and benefit analysis. That is not to say that the balance of those not chosen were not worthy of consideration.

Mr. Nicholson said that among the five groups they ended up with 11 options in the residential, commercial and industrial energy use category, 10 in the energy supply, 13 in transportation land use, 12 in agriculture and forestry, and 6 in crosscutting issues.

Mr. Nicholson referred to a list of GCCC members active in the various workgroups. In July those higher priority items were selected for further analysis and the next step or phase leading up to the meeting of October 12, 2006, is the fleshing out of what those options mean; i.e. defining the options. The process of defining is very much a group effort and in fact some of the individuals on the GCCC are helping to draft these measures in terms of the definition of the measure itself.

Mr. Nicholson called on Mr. Toben, member of the CAPAG, to talk about his role in the working group.

Mr. Toben recognized the Division of Air Quality and the Center for Climate Strategies for a decision making process that is extremely well managed and well run. He said he had spent the last 22 years of his career in the private sector where they pride themselves in efficient, effective well managed operations. Mr. Toben said that this process is highly structured, highly efficient, and is designed to leverage the knowledge and expertise of the stakeholders in the process.

Mr. Toben spoke on behalf of the Energy Supply technical work group. Mr. Toben focused on the environmental portfolio standard (EPS), a hybrid between a renewable portfolio standard, a policy requiring utilities to provide a certain percentage of their retail electricity from renewable resources by a specified date, and an RPS. The difference between the environmental portfolio standard and an RPS is that you are blending a measurable energy efficiency goal with an RPS in order to create this hybrid, referred to as an EPS.

Mr. Toben said that the process in evaluating the viability of these different mitigation measures, looks at the potential emission reductions and cost from each one of these items. This is one item where the potential emission reductions are high (high being defined as at least 1 million metric tons of carbon dioxide effecting at least one million metric tons of carbon dioxide equivalents per year by 2020). The specific cost will be informed by the RPS study that Commissioner Kerr described. Relative to other RPS's across the country we know that the cost relative to the return is low. So, energy efficiency applications that might be married to an RPS might include investment in combined heat and power, a metered solar thermal, and energy star appliance standards. Utilities will have the option either to generate their own renewable energy or to purchase these renewable energy credits (RECS).

Mr. Toben said that the utilities IRP plan from 2005 indicated that the growth in electricity demand will be about 35 percent by 2020. The estimated cost of this RPS is then compared against the portfolio of new nuclear natural gas power, not against existing conventional generation resources.

Mr. Toben said there are currently 22 states, plus the District of Columbia, that have an RPS and 13 states that have proposed RPS legislation. These are policies which have induced the private sector to invest \$52 billion into the states that have these standards. North Carolina is not the beneficiary of that private capital investment because we don't have an environment that is friends today with these renewable generators. We need those policies if we really want to see significant utility scale renewable generation coming to North Carolina.

Mr. Toben said that no state has repealed their RPS target and several have increased their targets. What we are seeing is, contrary to our intuitive sense, these are policies that are not anti growth. These are not policies that will drag the economy but policies that have stimulated the economy.

Mr. Toben said that when we talk about renewable energy we are talking about two forms: wind and solar and biomass, including wood, landfill gas, agriculture and clean construction and demolition waste. These are resources that would offset base load electric generation, roughly half of which is from coal fired power plants in North Carolina.

Mr. Toben said that if we look across the states today and we take North Carolina's particularities into account, it looks like the recommendation from the technical working group would look like a one to ten percent gradually ramping up a RPS starting in 2008 and moving up to 10 percent by 2017. It would be married to an energy efficiency goal of 10 percent, ramping up from the current period of 2008 to 2020. So, where we believe we could end up in a conservative way that really stimulates the economy and creates little to no drag, is about a 20 percent EPS by 2020 with about half coming from renewables and about half coming from energy efficiency measures.

Mr. Toben said the types of reductions we would see from such a policy would be carbon dioxide reductions that would offset existing coal generation and be put in place instead of new coal generation capacity in the future peaking renewables such as solar and coastal wind, which peaks at high demand times and would offset

carbon dioxide emissions from combined cycle and combustion turbine natural gas facilities. To some extent, renewables would offset carbon dioxide emissions in other areas.

Mr. Toben said that they would also be looking into taking animal waste and landfill gas and converting it to energy. These would reduce methane emissions by changing those to carbon dioxide.

Dr. Everett agreed with Mr. Nicholson and Mr. Toben that we have a structured process which meets a lot. In addition to the technical workgroups, there is the bigger advisory group that has conference calls and exchanges of e-mail, routinely. It is very difficult to keep up with all of the progress being made, but it is being made in the right direction.

Dr. Everett cautioned that the list has been whittled from a couple of hundred to about 50. This list is in no way an endorsement of any concept but simply a list of things that would then get further study to evaluate their cost effectiveness against any greenhouse gas reduction capability. So, they have a long way to go before they have a single recommendation for the Commission to look at.

Representative Hackney pointed people back to slide five where all of the items are labeled "priority for analysis draft potential mitigation options for analysis". This goes along with Dr. Everett's comments.

Mr. Nicholson added that they do plan to follow on analysis once they have decided the definition of the measure and what all of its features are. They would add to that where they think significant opportunity is for economic benefit to the state.

Dr. Everett added that there is some frustration with the energy supply team as this is also a subject of study by the Utilities Commission. So, there is a duplication and overlap that takes a lot of time and effort from those of this Commission.

Dr. Smith complimented the process and said it is moving forward with deliberate speed. Although they have not reached any firm conclusions, they have the outline and methodology by which they will be able to come back to this Commission with some good analysis and objective facts about what is available to the state. We need to establish a good baseline and recognize where the problems are to be as proactive as possible.

Mr. Profeta recommended that, as a Commission, we discuss how to align our work plan with everything else that is going on. We need to work out a plan to work in tandem and collaboration with these processes.

Mr. Profeta said he had two questions for the energy supply workgroup. One is in the analyses planning, how much are you looking at the effects of other criteria pollutant programs? And, would there be some way to allow for some type of comprehensive permitting for other air pollutants as well as carbon?

Mr. Nicholson said we would definitely want to look at that. He called on Mr. Tom Peterson with CCS.

Mr. Peterson added that they are now in the process of trying to firm up policy design, focused on what to do and then on how to do it. He said at some point they would be able to take a look at the wide range of options on the table and see if there were some more cross cutting implementation mechanisms that might be brought into play in support of the packages the group is beginning to focus on. They anticipate those issues would come up at the next meeting on October 12, 2006.

Mr. Nicholson responded with the efforts underway regarding RPS and public benefits fund, they would want to look at policy design. They could certainly provide some additional analysis for those approaches being looked at by the Utilities Commission and offer some analysis on certain other options.

Mr. Profeta asked if the benefits would be looked at with regard to other emissions and how to avert other emissions.

Mr. Peterson said they were looking at the will of the group to identify those key issues.

Dr. Everett said that someone may be able to help in answering Dr. Smith's question on how to measure where we are in energy intensity. One of the things we need to be careful with is, with the rate of growth occurring in the state, we are going to have a change in the baseline no matter what we do. One of the things we can look at is energy intensity across a time curve which will give us a better measure of how we are performing.

Representative Hackney asked Dr. Everett to explain energy intensity across a time curve.

Dr. Everett explained that it was energy we use in developing products in this state per state gross product versus how we are doing compared with other economies around the country.

Mr. Peterson said that in the inventory and forecast report developed, there are measures both of absolute emissions and relative emissions rates broken down by all of the sectors that will be focused on in the next week.

Following the lunch break, Mr. Michael Shore was called on to discuss Residential, Commercial, and Industrial as well as Transportation and Land Use.

Mr. Shore said that part of the opportunity for this Commission is to see what things on the list is worth our debate in the near term and which of the things should be waited on for the CAPAG process to be finalized.

Mr. Shore said that one of the issues is the energy efficiency funds which may impact the global warming issue in the carbon emissions. Another issue that seems interesting is the building codes. There is tremendous opportunity in the building sector to be more efficient with the energy that sector uses and how we can use building codes to improve energy efficiency and reduce global warming pollution.

Mr. Shore said that education is also important and is one of the things that are a barrier for us to be able to have more renewables. We do not have a trained

workforce to help homeowners and businesses implement such measures. We should be using our excellent community college system or other educational resources to develop the infrastructure and train the people to do this work. These are near term considerations.

Mr. Nicholson added that while we have not tallied the numbers for these measures in our process, what has been observed in other states is one of the largest and quickest ways to get greenhouse gas reductions is through the energy efficiency energy conservation area.

Representative Hackney said that we have a State Energy Office that is actively working on that already and we have various energy saving initiatives in state government. There is also real significant energy efficiency in the private sector.

Mr. Garrou asked Mr. Nicholson if there was any effort to correlate the economics of energy efficiency with the reality of the useful life of a particular facility.

Mr. Nicholson said that one realization they have is, with any of the options they pick, the numbers have to work from an economic standpoint. They design the option to allow for it to work.

Mr. Peterson said that the payback periods are explicitly looked at and are particularly shorter term. The questions that typically come up are questions such as what standard payback period in the market these things will work under standard payback. If they don't work, how much can they be stretched for various reasons and how best to stretch them.

Mr. Peterson said he did not know exactly where the payback numbers are on this. They certainly could be provided but he believes that they are pretty near term.

Mr. Nicholson added that the work group is working closely with members from the State Energy Office. In current drafts under this category, those activities they have or are initiating are in terms of energy savings.

Mr. Urlaub added that there are 15 corporations in North Carolina called the Energy Services Corporations who provide performance contracting services to the state government through a current law which was just expanded in the last legislative session. This was doubled in size from \$50 million to \$100 million in contracts in place at any given time and was expanded to include water resources as well as energy.

Mr. Urlaub said that one of the things they learned in the Energy Independence Act last year was with state facilities, even though the government owns the facilities, there is no common disconnect between builder and home buyer or commercial lease with government. Matching that up with the savings and subsequent years in the operations budget is a challenge before us as a state. It is very difficult to estimate the energy savings or avoided energy costs of building a more energy efficient building in North Carolina. This is a change that could also impact other aspects of government as well.

Representative Hackney asked the members their feeling about green power purchasing. He asked if we wanted to wait for the Utilities Commission studies to play out before jumping into that or is there sentiment one way or the other on that subject.

Dr. Eggers said that some students at UNC Asheville have done a recent analysis of what it would take for us to offset our total electricity consumption with green power. Last year we consumed 15.8 million kilowatt hours. They found that Renewable Energy Choice in Bolder, CO is only 1/5 the price of N. C. Green Power. N. C. Green Power is extremely expensive when compared to national competitors. So, she said that if want to do this, she would want people to buy from outside of the state where there appear to be more efficient markets and more competition.

Dr. Smith asked Representative Hackney if he was talking about the voluntary program that N. C. Green Power has or was he talking about the larger issue of renewal energy as an opportunity for the state going forward on a broader sense.

Representative Hackney said he was talking about the latter.

Dr. Smith said he believes that this is one area where it will be valuable to wait for the study because the voluntary N. C. Green Power program was really not designed for nor has it been carried through to be a program that really leads to significant renewable energy investment in the state. It is a leading edge kind of program that provides a certain amount of value in customer education in letting early adopters who are willing to put some money on the table initially to give them choice, but it isn't designed for nor was it really constructed to be a program that really gets you megawatts.

Representative Hackney asked what the program was designed for.

Dr. Smith said it was designed to provide some customer education about renewables, to meet a certain level of frustration within the early adopters in the market who don't have a choice, and it is a program used extensively by utilities as a public relations program to say that they are doing something on the area of renewables.

Mr. Toben explained the difference between a voluntary program and a RPS or mandated program from a renewable energy corporate viewpoint. The voluntary program can't work at large scale because you need forward guarantees of ten to twenty years in the form of power purchase agreements from the utilities to purchase hundreds of megawatts of green energy in order to stimulate the renewable sector in North Carolina. The way that these deals are financed is typically 60/40 debt equity deals. In order to finance a 100 megawatt wind farm, you need to raise \$40 million of equity and borrow \$60 million of debt. The only way to finance that debt is for the bank to see that there is a long term purchaser, and that purchaser has to be the utilities in North Carolina because of our regulated environment. It really boils down to a scale issue. In order to do any of these deals, you need debt financing at a magnitude that N. C. Green Power or any voluntary program is never going to get to.

Dr. Smith said that he would reinforce Mr. Toben's statement. Dr. Smith said that in the entire program they looked at with other utilities, the N. C. Green Power program

was the only program where the utilities did not put some money up front to guarantee the capital for the renewables to be deployed. That is one of the real challenges with this program.

Mr. Urlaub said that the way they have designed their program, N. C. Green Power does not supply any kind of long term contract purchase to folks. So, what we have is small residential systems. On the up side, this has been a great educational opportunity for us in the state. The first homeowner to connect to N. C. Green Power had to work with the utility four to five years before they finally got their system online. Now we are down to a year. This program played an integral role in learning how to integrate different types of energy generation into our system. Mr. Urlaub did agree that it is limited in its potential even if government decides to purchase a green power to offset its own use. What we would not realize is the market competition because the way the green power program is set up is to facilitate small residential systems. If it got a big infusion of money from the government to purchase really large utility scale systems, which only an out of state company would likely provide, you would not get competitive pricing.

Mr. Shore said that we are fortunate that the Utility Commission has embarked on the study of the RPS and that they are planning on having drafts being done by the end of this year. That gives the advisory committee some real information to work with.

Mr. Shore said, with regard to the energy efficiency issue, we are at a crossroads in North Carolina with our electricity demand. The utilities are moving forward with pursuing new power plants and there is a proposal for the new Duke Energy plant at Cliffside that will raise rates. Many of the energy efficiency opportunities in front of us are going to be half the cost of building a new power plant. Another way we can make a real difference is by figuring out what the energy efficiency opportunities that are cost effective for businesses and households are that make sense for the state as a whole that could put off the need for the new power plant or displace it altogether.

Mr. Nicholson reviewed the Energy Supply Goals listed on page 4 of the slides in Exhibit H.

Dr. Smith said that he had the benefit of listening to a presentation by a company that was doing combined heat and power and following that presentation had a chance to speak with someone from that company who has representation in North Carolina. He said that as we look at upcoming meetings, having more discussions of combined heat and power may be a very useful exercise for all of us. Anywhere from two thirds to one half of the heat which is energy goes overboard. Capturing that heat and putting it to use for industrial processes is a tremendous benefit to looking at issues around carbon emissions and increasing industrial efficiency and ultimately increasing better use of the fuels that we use.

Dr. Smith said he would be willing to share some information in a briefing of combined heat and power for our group in the coming months.

Representative Hackney said that he believes the power plant at Chapel Hill does this by heating the dorms with waste heat.

Mr. Urlaub said he was curious about what other members of the Commission think about the economic benefits side of a combined heat and power system that could have a cost recovery of a decent period which could free up money for a business such as an industrial facility or a farm application.

Mr. Givens said that the study by Dr. Mike Williams at NCSU, to identify environmentally superior and economically feasible technologies, is complete. Now the question is what we do to implement it.

Mr. Toben said he would be interested in hearing from the utilities about the cost structure at a high level of pulverized coal versus IGCC. In order to recommend incentives we have to have a better idea of what the difference is in cost structure. While an IGCC plant has a higher first cost, it runs with such greater efficiency that its cost per kilowatt hour of production is the same as a pulverized plant. With IGCC we can capture 98 percent of the carbon coming from these plants. If that cost is similar, it seems like that would be an area that would be ripe for the picking if we can provide folks with the incentive to get over that hump.

Mr. Nicholson reviewed the Transportation goals listed on page 5 of Exhibit H.

Senator Cowell asked about tax credit for biofuels and what different approaches are being made, given the expense of this approach, and how they can drive a market.

Mr. Nicholson said they had looked at reducing the fuel tax or a per gallon credit.

Representative Hackney noted that we enacted tax credits for both bio diesel and ethanol in the last session. What will happen as a result of this is unknown. There is a big bio diesel plant opening in Chatham County which carries with it a big tax credit so they have to make money to use it. The resistance to a moratorium on a motor fuel tax was considerable.

Mr. Givens said that the General Assembly did freeze the variable rate on the motor fuels tax in the face of rapidly escalating gas prices. This also has some consequences for transportation funding that are less welcome.

Mr. Glaser said there is a great deal of activity going on within the automotive industry about these issues. He said he was interested in what technology is out there right now in the area of transportation. Most of us are driving around in vehicles that we could be putting ethanol into rather than E-10 or regular gasoline. There is a consumer awareness issue that needs to be addressed.

Dr. Riggs said the state could benefit from addressing the transportation infrastructure down in the barrier islands. Also, we have hundreds of miles of state highways 264 and 64 that form these incredible dikes around the peninsulas. For mid term or long term, we need to deal with evolution of ecosystems and land loss associated with that. Long term this is a very big part of the transportation problems associated with the climate action planning advisory group.

Mr. Nicholson said that we have an item called adaptation that needs to be addressed.

Mr. Givens followed up by saying that we were looking at climate change from an air quality perspective but the other impacts that Dr. Riggs pointed out are equally as important.

Mr. Shore asked Mr. Glaser about his recent editorial in the Charlotte Observer and asked him to reiterate what he had stated in his article.

Mr. Glaser said that he had stated there was a tremendous opportunity relative to alternate fuel vehicles that is not being touched at this point. General Motors, Toyota, Honda and Ford are spending an incredible amount of money on research and development of these alternative fuel vehicles and maybe there is opportunity for state legislation to provide some type of tax credit for the purchase of these vehicles.

Senator Cowell said that would be a secondary step since we don't have any infrastructure in place.

Representative Hackney said it may be productive for us to have a discussion about infrastructure at some point from the petroleum marketers or someone equally knowledgeable.

Dr. Uzochukwu asked Mr. Nicholson if there has been input from the transportation industry on these ideas.

Mr. Nicholson said that these are ideas that others have looked at, so the list was made for raising the discussion and consideration of them.

Dr. Uzochuckwu asked Mr. Nicholson if he planned to involve DENR or DOT in finalizing the list.

Mr. Nicholson said that someone from the Board of Transportation is on the workgroup.

Dr. Smith added that diesel has almost a double whammy in the climate scenario. You have the actual petroleum diesel that is predominately being used until we get the bio diesel market up and running. But diesel also puts out black carbon particles, which are the fine particles that cause health problems and change the reflectivity of clouds and snow. There are some good federal legislation required mandates that are kicking in next year regarding diesel. Finding ways to either incentivize or require some of those older engines to be retrofitted to the new standards that are coming on will help tremendously in co-benefit of human health but also has a very direct benefit for climate. In the grand scheme of things, it is not a real costly expense to do the retrofits with the benefits that have been clearly documented.

Mr. Givens noted that there was a provision in the Energy Independence Act that created the biofuels industry strategic plan workgroup. That group consists of NC State, NC A&T, The Rural Center, Biotech Center and other folks who work cooperatively with it. They are supposed to prepare an interim plan and submit that by January 15, 2007 and a final plan is supposed to be submitted by April 1, 2007.

Mr. Nicholson reviewed the Agriculture, Forestry and Waste Management goals listed on page 5 of Exhibit H.

Mr. Peele was called on to explain the pending draft CAPAG Mitigation Options listed on page 10 of Exhibit H, CAPAG group advisory report. He said the best way to keep people involved in farming was to make farming more profitable. So, some of these mitigation options offer some promise in those areas.

Mr. Peele said he would focus on options one through six. With the regard to bio diesel production, there are a number of small projects in place in North Carolina now producing somewhere in the neighborhood of 5 to 10 million gallons of bio diesel.

Mr. Peele said that they are working with a group of farmers in eastern North Carolina to build the first large scale bio diesel plant in the state producing 30 million gallons a year. This will give farmers an opportunity to move some of their products in additional markets and get some return in that area and also help clean the environment by promoting the use of cleaner fuels. It also gives them ownership in these large diesel processing operations.

Mr. Peele said that this project is moving forward and is expected to break ground sometime in either the first or second quarter of next year. By 2008, we will have the capacity of bio diesel production in the state increase dramatically.

Mr. Peele said that the working group went through each mitigation option and provided a brief description of them and also set goals for bio diesel production. By 2010 we could increase that capacity to capture about two percent of the diesel use in the state. Currently we are using somewhere around 125 to 150 million gallons of diesel in North Carolina each year.

Mr. Peele said that in North Carolina we have the capacity to produce somewhere between 150 and 250 million gallons of ethanol by 2008, so by 2020 we could double our capacity. There are a lot of opportunities for ethanol production, not just using corn but cellulosic ethanol. Currently, we do not have a commercial scale operation in the U. S. In Canada, a company called logen is the closest to coming online with a commercial cellulosic ethanol production plant. The technology is very promising but there still needs to be some tweaking before it becomes commercially viable.

Mr. Peele said that he serves on the national level on the administration's biomass research and development advisory committee. They have set long term goals for the U.S. to achieve by the year 2030 in terms of bio fuel production. The goals are extremely ambitious. They are proposing that we produce 51 billion gallons of renewable fuels in the U.S. by 2030.

Mr. Peele added that they are dealing with preserving open space: anything we can do to keep farmers in business and make them more profitable. They are working with the Department of Agriculture but need to make sure the program gets funded adequately.

Mr. Peele said that there is a lot of research going on with biomass feed stocks for electrical and steam production. Mississippi State University has proven the technology where you can take waste sludge from human wastewater treatment plants and make bio diesel. They are even looking at certain types of algae to produce bio diesel at a large scale. If we are going to meet some of these ambitious

goals of 51 billion gallons of renewable energy a year, we are going to have to look at some of those new and promising technologies.

Mr. Slocum was called on to review the forestry goals of the working group. He said that strong markets and making it profitable or economically viable to keep land in forests is to a large degree what they have looked at. One very promising alternative or option is value added prior to pulping. What that would do is, once the commercialization of the process is available, it is very easy to tack that on to existing pulp and paper facilities and turn these facilities into bio refineries. There are five pulp and paper mills in North Carolina that have the entire infrastructure to handle wood, gather wood and break it down. It is very easy within that process to pull off what is needed for ethanol production and send the cellulose forward into the pulping process, continue to make paper and develop a whole new product screen for the industry.

Mr. Slocum said on the wood energy side, the current green power program in North Carolina really limits the utilization of wood as a renewable energy source and only allows for a very narrow stream of wood waste to be considered green power. This is an unnecessary limitation.

Representative Hackney asked Mr. Slocum how much of forestry products are now underutilized.

Mr. Slocum said that we need more markets for low end, low value materials or first thinning to produce management and growth of residual stands. There are foreign firms looking at exporting significant volumes of wood from North Carolina to burn as renewable energy in power plants overseas. Mr. Slocum said he would like to see that resource stay here.

Mr. Slocum said that on the energy efficiency carbon dioxide reduction side, there is research available from a group called Quorum, which is the consortium for research on renewable industrial materials. The work that has come out of that group shows that wood products are superior to all of the other alternative sources when it comes to utilization of construction in housing. From every standpoint, whether it greenhouse gas potential, air and water pollution, solid waste, energy efficiency, wood is a superior product yet in North Carolina and other states we are considering environmental building standards that are biased against utilization of wood. A good example is the Lead Program. It actually gives more value to using recycled steel than it does to using wood. This limits wood to only wood that can be certified under what is known as the forest stewardship council standard. This limits your ability to plant trees after harvest.

Mr. Slocum said with new markets you also have a need to look at the long term wood supply and keeping land under good management and reforestation. One of the programs in North Carolina that could use an infusion of additional funds is the State Cost Share Development Program which provides a cost share to landowners for reforestation and timber stand improvement work. Currently that program is funded two thirds by the forest products industry and the state puts in about \$600,000. Conservation easements is another viable and very useful tool that is part of the mix but unfortunately far too many of the conservation easement programs that are out there significantly limit or even prohibit forest management on the part of the

program. Again, counterproductive is how do we reduce our carbon footprint, how do we utilize our forests to help soak up carbon dioxide as well as provide products.

Dr. Everett said he was interested in the cross cutting scenario. One of the things Mr. Slocum talked about as a way to increase use of some of these products would run directly into the RPS proposal which says what should be eligible for a resource would be biomass and coal-fired power plants. So, we need to make sure that when we write the RPS or look at one we are also looking at encouraging the use of biomass and that we don't take away that option.

Dr. Smith said that during the time that the N. C. Green Power program was being debated amongst the stakeholders, there was recognition that when you are asking customers to voluntarily pay extra, you would give them what is characterized as a premium product. The market surveys that have been done show that customer preference is higher for renewable technology like solar and wind over biomass. It was actively discussed that if you had a RPS or an across the board renewable type program, biomass should not be limited and should be a full player.

Dr. Smith said that the agriculture and forestry industry should be the area that North Carolina has the most to gain from in the win/win scenario. He strongly promotes using forestry for renewable energy production and also looking at cellulosic ethanol. Anything we can do to incentivize that and get the market straight to take advantage of that is a tremendous possibility that has real economic development and national security implications and is also good for the environment.

Mr. Peele added that the only way to meet the 51 billion gallon a year goal that the national committee has set is through the use of cellulosic ethanol and that represents 37 of the 51 billion gallon a year goal.

Mr. Slocum said that in North Carolina, forests are the dominant land use in the state. What makes us different from the west coast is our ownership pattern. Ninety percent of that forest land base is privately owned by over 600,000 individual forest land owners. The best way to encourage and keep that land in forests and properly manage it is to provide strong markets for what they are growing and to help them in the reforestation and long term management.

Mr. Urlaub said it strikes him that the cross cutting issues may also address some of the forestry and agriculture goals. There is a clear interface with energy supply. In the instance of biomass coal firing, if we only consider that under energy supply or under agriculture and forestry, we will miss the electric rate impact.

Representative Hackney asked if there was an electric biomass generating plant in the United States.

Dr. Smith said we had one in North Carolina located in Craven County. It is a 42 megawatt wood energy facility that also coal fires other materials such as clean construction and demolition waste.

Mr. Peele said there was a company called Fiber Watt that is looking to locate in North Carolina. They will build a large scale operation that takes poultry litter and convert it into electrical power.

Ms. Will said that they had successfully completed coal firing of biomass trials at the plant in Sutton. This has helped industrial customers manage wood waste. They are also working with NCSU researchers on a process to make some wood use waste that could be coal fired. Coal firing can provide some solutions for us.

Senator Pittenger asked Mr. Nicholson what we could anticipate in terms of impacting global climate change as a committee.

Mr. Nicholson said that the economic benefits to our state are a significant co-benefit in greenhouse gas reductions.

Senator Pittenger asked that we consider at future meetings some further input in terms of the science of global climate change. He said he had recommended speakers (see Exhibit D) for consideration by staff and asked that we have some additional input from climatologists.

Representative Hackney said that his suggestions would be considered.

Mr. Nicholson concluded his comments by saying that an extension of these discussions will lead to the issue of what carbon sequestration benefits can we take to both the farmers and forest land owners.

Mr. Garrou asked Mr. Slocum to clarify converting wood to cellulosic ethanol and then being able to use the wood product for its original intended use. Mr. Slocum said that the wood sugars are extracted to produce ethanol and the cellulose moves forward into the pulping process. You take a single product and create a bio refinery.

Dr. Smith said that turning wood waste into a bio char is used as a soil amendment to decrease the amount of fertilizer that has to be put into the soil and increases the productivity of the output whether it is forests or crops. That carbon char in the soil stimulates the biological activity of the soil which then causes the microorganisms in the fungus to increase the amount of carbon uptake. Fertilizer is obtained from natural gas and that is where the nitrogen comes from in the fertilizer. That process is carbon intensive. So, by creating this bio char, you basically use it as a soil amendment. This could focus on opportunities to build consensus about some low hanging fruit that would be part of an interim recommendation to be brought to the legislature in the next session.

Mr. Nicholson reviewed the cross cutting issues on page 6 of Exhibit H (slide presentation). He reiterated that public education does cross all of the necessities for general public education and outreach and specific to industry sectors and individuals.

Mr. Nicholson said that we are one of the few states that are looking at the issue of adaptation and what should be considered given that we may very well experience some effects of global warming.

Mr. Nelson said it is important to make sure companies that take steps now get credit for it and that we continue adaptation issues of exploring goals and targets for North Carolina.

Dr. Riggs said it disturbed him that the issue of adaptation is low on the list of goals. When we start talking about the effects floods, storm dynamics, droughts and the impacts of sea level rise, and the fact that we are not dealing with that on the short term can be catastrophic. Another big storm would blow our economy in this state. There are 4,000 miles of estuarine shoreline that are eroding with each storm up to as much as 50 to 100 feet. This is driving everyone who is building down there to hardening shorelines. We are dealing with a rise of sea level that is at least two feet per century. And, with a very high probability of going to four to six feet of land loss, one hundred years from now, a little rise will have a dramatic effect. If we don't deal with that today, we are going to be in terrible straights 25 years from now.

Mr. Tom Peterson, Executive Director, The Center for Climate Strategies gave the next steps for the Climate Action Plan Advisory Group (CAPAG).

Mr. Peterson reviewed the slides of greenhouse gas growth rates (Exhibit H) and the associated impacts of sea level rise. He said to put the next step goals in context for North Carolina, Arizona is the fastest growing state in the U. S. in terms of emissions and North Carolina is the second fastest growing state. These numbers are in the process of being reviewed. The average growth rate is at about the 50 percent level. Growth rates play a very important role in structuring the level of effort in the solutions that come out of the climate change planning processes and all states are not created equal whether it is in terms of their size or their growth rates. The differences in states have played a critical role in the establishment of goals.

Mr. Peterson said that in the goal setting process, it was important to close the alligator's jaws. The top jaw of the alligator is the uphill climb in emissions that we see and the downhill jaw is where we want to go in the future. They are in the process of identifying pathways of finding ways to close the alligator's jaw to reduce emissions. Mr. Peterson referred to Exhibit H, State Climate Goals on page 7.

Mr. Peterson said the most recent data in California is AB32, the first state to establish a mandatory economy wide cap. The rest of the goals are voluntary goals.

Dr. Everett said that this raises the question of carbon intensity.

Mr. Peterson said that carbon intensity or greenhouse gas intensity is a very important forecasting variable. These growth rates in emissions are to a large extent driven by the amount of greenhouse gas that is emitted per capita, per dollar, per some series of measures. This is one of the ways growth rates are forecasted for the future. It is also one of the control variables they look at. If the emission intensity levels were to remain static, then the growth rates would continue because of expanded economic and population growth.

Mr. Peterson added that there are a variety of factors that affect emission levels. In forecasting they try to split out the underlying variables that are driving growth and figure out what they can do to manage them.

Mr. Urlaub asked Mr. Peterson, for their projection for North Carolina up to 2020, if they assume for the utility portfolio that it will be the same as it is today.

Mr. Peterson deferred Mr. Urlaub's question to Dr. Everett.

Dr. Everett said that the folks participating in that workgroup will be discussing the utility portfolio projections at their meeting on 12 October 2006.

Mr. Shore asked for further discussion generally about the value of goals in North Carolina: the reasons why North Carolina might consider goals and the potential disadvantages of the goals and what has motivated other states to go in that direction.

Ms. Tompkins asked Mr. Peterson if they were to give a forecast for the percentage for 2010, what that percentage might be for North Carolina.

Mr. Peterson said from 1990 to 2010 would be two thirds of whatever the overall level of growth is.

Mr. Profeta asked Representative Hackney and Mr. Givens how we can use the work of the CAPAG in the Commission and apply it to our mandate.

Representative Hackney said that to continue to do and redo what we have done today and to try to reach consensus using the work of CAPAG and the other information from various sources is a process that will work.

Representative Hackney said he sensed a fair degree of acceptance and openness of minds with respect to the CAPAG work. He said this Commission would continue to hear relevant presentations to add to and continually hear from CAPAG.

Mr. Garrou added that there seems to be tension between not wanting the Commission to sit back and await developments but on the other hand not duplicate the efforts of what these task forces are spending a lot of time on. Mr. Garrou said that his feeling is to set out on some course that might or might not be a duplication of what CAPAG is doing. He also said that we ought to at least wait another cycle or two before we decide what we should do in relation to what they have produced.

Dr. Smith said there is clearly a good amount of good work within CAPAG and that is going to continue. He senses that there are some issues that may be riper towards consensus or a general support of than others that may take a little more time to bake and analyze. One suggestion would be to spend some of our time going ahead and bringing those issues forward and discussing them as the CAPAG makes their recommendations and some of those things begin to fall out so that we don't get a big slug all at once. There are some issues that CAPAG may need to refine and some that need to be discussed where others may be able to bring forward their reports in a more timely fashion. There is also the challenge of the interim report that will be coming up in January 2007. If we can talk about and identify some of that low hanging fruit within the context of this discussion over the coming fall meetings, it may enlighten us and lighten our load down the road when we will need to spend more time on the more thorny issues. Surfacing those issues would be a good use of our time and will make sure that everybody in this group is comfortable with those winning, no regret scenarios.

Mr. Givens said that the goal question is an important aspect of the authorizing legislation the Commission directed to consider. Mr. Givens said that in the time he has been at the General Assembly, he has been involved with the setting of two goals. In late 1989, a goal of 25 and 40 percent solid waste reduction goal was set and in 1995 a 30 percent reduction goal of nitrogen in the Neuse River was also set. He realizes those are very different questions than the ones here but there is something to be learned from those efforts. We have achieved the solid waste reduction goal magnificently in the negative. The nitrogen reduction goal has by and large succeeded. He said we need to take these things into consideration as we set goals for this Commission.

Representative Hackney said he did not see the issue of a goal as a matter for the interim report.

Mr. Slocum said that with regards to the interim report and the CAPAG process, it might be appropriate for the purpose of moving forward if there were some direction either from this group or from the Chairs back to the CAPAG as to what they would like to see them produce for us to consider as part of that interim report. It might give some additional direction or finality to the issues of the CAPAG group while providing the Commission with information that we could begin to discuss in some detail as part of an interim report.

Representative Hackney said the idea of coming up with 250 suggestions and synthesizing them down to 50 is a right on target way to go about it and also allows us for the interim report to pick the easy ones if we want to.

Mr. Peterson referred to page three of the memo in Exhibit H which lists the next steps and a timeline of the CAPAG process. To coincide with the interim report, what they expect to have under present plans at that time would be a first round of analysis completed for all 52 of the options that the group has agreed to quantify. So, they would see a complete economic analysis for each option. At that stage of the process they would be inviting the CAPAG to identify options they believe there is a consensus for moving forward on and identifying the remaining set that requires more work.

Mr. Garrou asked Mr. Peterson when the first round of analyses would be available.

Mr Peterson said a meeting date had not been set for January 2007 but they would expect to have all of that information completed by early to mid January 2007 as preparations for the next decisional meeting of the CAPAG.

Representative Hackney asked Commission members to e-mail him with any questions they have about how we are proceeding.

Dr. Smith said that we had discussed at a previous time about the concept of committees and the fact that we did not want to be redundant. He asked if the issue of adaptation was an area that needs special attention given the vulnerabilities that are unique to a coastal state and some of the things referenced earlier by Dr. Riggs. He asked if that may be an area that we might want to make an exception for as to where we do have some additional work to be done between these meetings to

really dig down to further identify those vulnerabilities and to understand adaptation and the economics of it.

Dr. Smith asked if we should contemplate looking at the adaptation question in a little more detail and figure out a way to bring some recommendations to probe that further as part of the interim report.

Representative Hackney thanked members, speakers and staff for attending and said there was a considerable amount of thought that went into the construction of today's meeting and he believes we are off to a good fall start.

The meeting was adjourned at 3:10 PM.

Representative Joe Hackney
Presiding Co-Chair

Mary R. Watson
Committee Assistant

- EXHIBIT A Meeting Notice
- EXHIBIT B Meeting Agenda
- EXHIBIT C Visitor's Registration
- EXHIBIT D Copy of Senate Bill 1591 and list of recommended speakers for future meetings of the Commission
- EXHIBIT E New member roster
- EXHIBIT F Copy of slides presented by Mr. Joshua Bushinsky, State Solutions Fellow, Pew Center on Global Climate Change, on actions taken or under consideration by other states to address global climate change
- EXHIBIT G Report presented by Mr. Robert Gruber, Executive Director, Public Staff, North Carolina Utilities Commission, on the proposal by the Public Staff of the North Carolina Utilities Commission to create a public benefits fund
- EXHIBIT H Report presented by Mr. Brock M. Nicholson, Deputy Director, Division of Air Quality, Department of Environment and Natural Resources (DENR on and discussion of activities of the Climate Action Plan Advisory Group (CAPAG)