Global Climate Change Commission
March 5, 2008
643 Legislative Office Building
Minutes

Mr. Garrou called meeting to order at 10:15 a.m. and welcomed Ms. Sonya McKay and the 7th graders from Exploris Middle School here in Raleigh. Members present include: Mr. Garrou, co-chair, Representative Harrison, co-chair, Senator Albertson, Representative Thomas, Representative Underhill, Dr. Eggers, Mr. Tim Toben, Mr. Thomas Cecich, Ms. Susan Tompkins, Mr. George Everett, Mr. Preston Howard, Mr. Michael Nelson, Mr. Mitchell Peele, Mr. Daniel Phaneuf, Dr. Ryan Boyles, Dr. Stanley Riggs, Ms. Jane Preyer, Mr. Robert Slocum, Dr. Stephen Smith, Mr. James Stephenson, Dr. Godfrey Uzochukwu, and Dr. Pete Andrews. The visitor registration is attached as Exhibit A. The agenda is attached as Exhibit B. Mr. Garrou called on George Givens for remarks.

Mr. Givens: Noted that we have three basic items, a discussion of the Climate Action Plan Advisory Group or CAPAG recommendations and what we are calling a consolidated format. You may recall a couple of meetings ago we went through one of those five technical areas and after we got through that we thought it would be better to shrink wrap that presentation. So that is the effort today. At some point I suspect that there will be some desire on the part of some members of this commission to adopt some or all of those as recommendations or at least as matters to be considered for further work by this commission in terms of developing proposed legislation. That doesn't have to happen today. We have not yet received the final CAPAG report the Division of Air Quality is working on that we expect to hear from Mr. Peterson and that will be the main item of the meeting. He was flying in this morning and I expect him momentarily – we intend to start in just a moment with Bill Holman who is going to present on options from state and local governments to consider in regards to adaptation. We are beginning to look at adaptation as an issue and then we had a request from Mack Pearsall with the Center for Environmental and Climatic Interactions in Asheville for some time on the agenda to explain what they are doing up there. We expect today to finish by 1:00 at the latest – we have not scheduled a lunch break.

I call your attention to the two additional meetings that are scheduled and in particular to the April meeting which was rescheduled in light of other scheduling considerations. The co-chairs and counsel met recently for an extended period of time and have developed the following plan for the balance of this interim. As to the future of this commission, as the law now stands this commission is expected to file a final report to the 08 session and then terminate. In talking with various folks it appears that we are not going to get out of the problems we are in with regard to global climate change in the space of two to three years and so there is a perceived need for some continuing entity to deal with both the mitigation topic and the adaptation topic. The current thinking on that is to extend the life of this commission by one more year until the 2009 session at which time it probably would be appropriate to consider some restructuring and I'll be happy to entertain your ideas and thoughts about that. There are various considerations that are under review as to how a restructured commission might be constituted. I will tell you that one of the important considerations is that we do not want to lose the expertise that has been developed and demonstrated among all of those of you who are non-legislators. That matter is under review.

With regard as to how we are going to proceed, today as I indicated we are going to have those discussions of the CAPAG recommendations and some discussion of adaptation. We will continue to work on both of those topics and we expect to have the final report including a microanalysis by Appalachian State University. There is discussion underway as to whether the final CAPAG recommendations and their economic analyses should be developed as two documents or one and presented as one item or as two items – that is a CAPAG matter that is under consideration. We expect at the April meeting to begin to discuss whether the state should set a greenhouse gas emissions reduction goal and if so what that goal should be. The general thinking about the way those goals are expressed is to achieve with reductions and emissions so as to produce emissions for some historic level. The normal base year often discussed is 1990 and to achieve those reductions by some schedule that might be spread out to 2050 and those are not suggestions they are just a description. Behind that idea is the idea of holding the parts per million of greenhouse gases in the atmosphere to some number less than 500 on the order of 450. You can be thinking about that and we'll have some material for you and some discussion of that in April.

With regard to the specific area which is mobile source emissions we have had some requests by the Automobile Industry to present on that topic and also some possible discussion of clean cars legislation. That is the adoption of the California Motor Vehicle Standards for North Carolina. A number of states have done that – where that matter stands at the moment is that the USEPA has declined to grant California a waiver that is required under the Clean Air Act for those standards. That matter is now in litigation and is likely to be resolved early next year since most observers believe that the next administration is likely to take a different view of the current administration on that waiver.

Commissioner Choi has asked us to hear a presentation by Effery Electric Power Research Institute and we expect to do that as well. We hope by the April meeting to begin transitioning into May and to actually have an interim report.

Mr. Garrou: Any questions of Mr. Givens? If not we will begin the agenda out of order by asking Bill Holman who is the Visiting Senior Fellow, Duke University Nicholas Institute to give us his presentation.

Mr. Holman: Good morning – I appreciate the opportunity to appear before you and I'm going to spare you a power point this time. A handout is coming around (Exhibit C) and I want to try to be responsive to the Commission and bring you some options to consider, these are not recommendations, and I bring them in the spirit of starting a debate in our state about how we should approach a very complicated and challenging problem of adapting to our global climate change. Just a really broad overview – one of the things that is challenging about this issue is there is really no one in our state who is responsible for taking the lead in our state for preparing for planning for adapting to climate change. We don't have any goals, we don't have a plan. We have a lot of programs going on but there is not an overall goal or plan and that's the spirit of my options before your begin to throw out some ideas that might become a plan. Just in the way of background as Mr. Givens already said there are efforts underway. You know the countries and our country is trying to stabilize and reduce emissions of greenhouse gases. Despite those efforts we're still looking at the problem that will increase in greenhouse or in concentrations of carbon dioxide in the atmosphere of about 450 parts per million by 2050. So there is an urgent need for strategies that you've been debating for many months to reduce the emissions of greenhouse

gases but because of emissions that you've already occurred and will occur in the future - there is going to be some warming of the climate. It is now an appropriate time to begin these discussions. We've thought of this adaptation issue as something of the future but I would argue in fact that we are adapting now in a hap hazard way but we are adapting now to global climate change. Our citizens are investing in beach nourishment projects we're building a dike around Swan Quarter, we're paying higher property insurance, we're hardening the estuarine shoreline. There are a number of activities that are underway that are part of the adaptation to sea level rise and climate change that really is no overall plan but those hap hazard actions are occurring. We don't really have good North Carolina data to make predictions about climate. We've got these regional climate (inaudible) national and international climate models are pretty good about predicting the international picture but in terms of how the weather in climate is changing in North Carolina, NC State's ECONet program they've got 30 monitoring stations around our state. We also have 100 counties we have different elevations even within counties so we don't even have very good information about the specific changes in climate in different parts of our state. Some of the general theory about climate change is that the warmer air will hold more moisture and that should produce more rain which we obviously are not seeing this year but maybe that is the long term trend. But that rain may be delivered and more intense storms so that may cause us some challenges with more runoff, less groundwater infiltration and all the models we use for water supply for the design of our waste water systems for the design of our storm water structures for our flood plains – they are all based on historical weather data. There is a recent article in Science Magazine called Stationarity which that is a new word for me. Stationarity is dead with our water management is really talking about the challenges that water managers will have in the future because all of their calculations about how much water is in a reservoir and planning for the future is based on historical weather data. Since the climate is changing it may make it more difficult to protect precipitation, to protect lake levels and that's just a challenge that we're going to face.

Obviously how the weather also increases evaporation for water supplies stresses crops and landscaping and decreases the ability of warmer water in the summer to cool our nuclear and coal fired power plants and hotter summers can lead to unhealthful levels of ozone. Sea level rise is a big challenge for us as Dr. Riggs knows a lot more about this than I do, but we've got about 1.2 million acres in North Carolina that are below one meter or below about three feet in elevation and particularly vulnerable to sea level rise and storm surges. There is a recent study by scientists at East Carolina, Appalachian State, UNC-Wilmington and Duke that estimated that about 6.9 billion dollars worth of property in just four coastal counties is at risk from sea level rise. I know you've been debating about the cost of reducing greenhouse gas emissions, there are real cost associated with the impacts of global climate change. Here are some options to kind of kick off the debate – the basic one is just inventory and understanding the existing programs that were maybe not intended to adapt to global climate change but in fact have some bearing on that. So we have the Homeland Security, Federal Emergency Management programs, the Army Corps of Engineers involved in hardening projects and in beach nourishment projects, the Department of Agriculture does deal with disaster, there are programs in the Environmental Protection Agency, DENR, Crime Control Public Safety, we have a lot of existing agencies that are active in this field. Then there is no coordinated effort but I think it would be helpful to you if the next administration have a better sense for who is acting in this area and where the conflicts are between policies and programs so that we just have a better understanding of what's in play. There may be some barriers in programs or some things where the programs really need to be made more flexible – a program needs to adapt so that it can play a role in adaptation, so inventorying existing programs. I would

say we need to be thinking about developing and adopting some goals and principles for adaptation. Again our current situation is we got a lot of different programs they are not really set up with adaptation in mind but they are acting in this area and that will continue to happen until the governor and General Assembly sets some clear goals and principles about this. This is the direction North Carolina needs to take in adaptation these are the things that are important to us as a state and that will help guide other public and private decision makers. There are some other good tools – our Customary Management Act the Federal Coastal Zone Management Act have this thing called consistency in them as a way of better knitting together state and local and state and federal coastal management policies. Our state Environmental Policy Act can be amended to require our consideration of both emissions of greenhouse gases and as we're building new infrastructure, whether it's a wastewater treatment plant or sewer line or new bridge or highway, if sea level rise or climate change is going to impact that infrastructure, that needs to be taken into account because you build wastewater plants for 50 years. So again looking at some sort of clear goals and principles from the state I think is an (inaudible).

Improving climate data and research – we don't really have the information we need to predict the impacts of climate change, the droughts, the floods or the weather and then NC State has a great ECONet system but again it only has 30 monitoring stations in our state and cost about half a million dollars a year to make that statewide and maintain that. I think that will be valuable not only to folks working on adaptation but folks who care about drought and people who are working on water management. Lots of people depend on basic weather information and having more localized data would be beneficial and obviously you have an expert here in Dr. Boyles who can provide more information about the value of that monitoring network. We already have in North Carolina some great resources for climate research – there is the National Oceanic & Atmospheric Administration has the National Climatic Data Center in Asheville. Asheville is developing a Center for Environmental & Climatic Interaction that I think Mack Pearsall will tell you about later. UNC Chapel Hill is one of the leaders in the country in atmospheric modeling, Duke University has great expertise in the climate/energy policy and the emerging carbon markets and there is expertise on other campuses too. So I think there is an opportunity here for some more just basic research and data collection and sharing that with public and private decision makers. You can think about perhaps setting up a consortium modeled on the Water Resources Research Institute which is a public/private university consortium that funds water research in our state and has been very valuable.

We need to plan for droughts and extreme weather – we've always had droughts, we've always had floods but again the scientists are predicting we may have more severe or extreme storms in the future and there are some efforts already under way but I think it would be beneficial for the state to really direct the Department of Environment and Natural Resources and the State Water Infrastructure Commission to really work actively with the League of Municipalities, the American Water Works Association, the engineering community and others to provide the kind of technical and financial assistance that both public and private water, wastewater and stormwater systems are going to need. Again we are looking at hotter temperatures, droughts, intense storms and we need to make our water, wastewater and stormwater systems more drought and flood resilient. One of the things we've discovered in the drought is different communities use a different definition for safe yield – that is their way of predicting how much water they have and it really varies whether it is Raleigh or Durham or Charlotte or Asheville. The different calculations/different risk factors taken into account – safe yield is a very fundamental concept in the water business it may be

useful to have a consistent definition across the state so that when the governor is asking a city how many days of water they have left he or she has a good sense for making the same assumptions about that and again amending the Water Supply Planning Act and the North Carolina Drinking Water Act to provide a standard definition I think would yield to better planning. Also getting our Environmental Health agencies to know when they are reviewing water plans that is a good time to be asking how are you going to guarantee/how are you going to provide those water resources in the future, have you thought about the next severe drought and the same for the Utilities Commission.

Our Department of Crime, Control and Public Safety already has a good program called Storm Ready. It is a set of best practices that they worked with primary municipalities and counties on and that could be adapted into more of a climate ready. Again the same thing is we find a lot of mayors and commissioners are concerned about this issue but we are not really clear what we should be doing. The Department of Crime, Control if you use that existing program to build upon it you get people thinking about what they need to be ready for the future.

Planning for sea level rise and more intense storms – we already have a good fundamental planning tool in the North Carolina Coastal Area Management Act and it could be beefed up to require that sea level rise be considered in things like permit decisions and in local land use plans. We could increase protection of coastal wetlands and their ability to migrate inland. One of the great things about coastal wetlands is they are not only productive for our finfish and shellfish and they filter water pollution but there is actually some ability for them to grow as the sea level rises and they also provide protection for inland properties. We are loosing a lot of our coastal marshes because we are hardening the estuarine shoreline. We're building bulkheads and when the wetland hits the bulkhead there is no place for it to go so it just erodes away. This is a very challenging issue of the coast it has been debated for over a decade but I think it is time we really have additional public and thoughtful debate about this. We have some tools in the Coastal Area Management Act, the area of environmental concern where you can come up with some coastal wetland where perhaps the most significant wetlands can be protected. Obviously we will probably keep the seawall or the bulkhead at Beaufort and Morehead City and some of our coastal communities. So we have to make bouncing here but we do have some very important coastal wetlands and we have some tools to deal with it and it is just time to get on with looking at those tools. And the same for the ocean front – North Carolina has a model law to protect our ocean beaches, our model law recognizes that sea level is rising and that the barrier islands are moving and I think that has served us well in adapting to the sea level rise. We have an Albemarle/Pamlico Natural Estuarine Program and they borrow some information from EPA. EPA has something called a Climate Ready Estuaries Program again, those are some things that the states should consider for rising sea levels.

Maps and public information – if you wanted a map of sea level rise it is really hard to get if you were considered buying a piece of property. That is the kind of information we ought to make available to the public so they can be informed and make wise choices about development and land use decisions. There is an easy way to do that through our NC One Map program. We have a number of programs that are already kind of active in this area but they are not well coordinated and you can think about certainly improving coordination as a first step. You can debate whether it would be wise to consolidate our natural hazard planning and regulatory programs. Those programs are principally in DENR and Department of Crime Control and Public Safety but we

ought to take a look at how effective those programs are at either their technical assistance, educational program, their financial assistance, mapping, how well are those programs working and could they be better coordinated or would it be more efficient to do some consolidation. For example our flood plain management and stormwater management programs are in two different departments, they're complimentary and they certainly could be more effective if they were coordinated in the future.

Finally another idea is to put out for public debate is should we establish a North Carolina Hazard Mitigation Fund so that we can acquire conservation easements or fee simple properties that are in the flood plain or they are in high risk areas so we can protect the public, prevent property damage and lower risks before sea level rises and storms occur. That obviously would cost money and funding options would be appropriations from the General Fund or you could consider something like a fee on filling and floodplain or building in high risk areas or even a surcharge on property insurance. All of those are controversial I understand but there are some areas in the state that we know will be very vulnerable to sea level rise and storms and if we will want to move people out of harms way we will need to have some way to finance those efforts. With that Mr. Chairman I will be happy to answer any questions and if there are any of these recommendations the Commission is interested in carrying forward in the short session we would be pleased to work with your staff in drafting a proposal and I also think there are other good ideas out there on this issue and again this is in the spirit of let's start a debate about adaptation and let the good ideas come forward. Thank you.

Mr. Garrou: Thank you Mr. Holman. Questions?

Dr. Riggs: Thank you Bill that was very good summary and statement. I want to make a comment first and then ask a question. We have many different aspects of the state government that are moving forward with very critical issues right now as we speak. To continue business as usual out there in the coast and this underscores the absolute criticalness of the time of timing with respect to going ahead because these issues will block the barrier island coastal system up. Not just for the next 10, 20, 50 years but forever, the way we do business out there and for example the Oregon Inlet bridge by itself is not a problem but connecting it to Pea Island which is a collapsing island and going away and the total cost of 1.5 – 2 billion dollars before we're done to build a bridge road system to nowhere 25 years from now is not solving our problem nor looking down the road. We have in the next legislative session that will be one of the first items to come on the House of Representatives is a bill to start hardening and stabilizing the inlets in North Carolina. That's a very serious event and we can't sit by and let these processes continue with what we know on what is happening on the barrier islands. My question to you because we have so many different agencies involved and just helter-skelter sort of approach, is there any way we can put a moratorium on things like the bill that is before the Legislature in an effort to let this new sub-commission or whatever it is that Mr. Givens was talking about to get their feet on the ground and get moving with respect to how we want this coastal system to look 25/50 years from now. The military is already doing this – they're putting significant amounts of money to answer the question when sea level rise is one meter and two meter what do we have to do to maintain these bases forever and keep them operational. The state of North Carolina has to do that also and do it now.

Mr. Holman: On the question of a moratorium – is the General Assembly can act however it desires but I think to your basic point is unless there is an overall frame work plan or goal about

how the state is going to adapt to global climate change we are just going to continue to make lots of piece mill decisions and they will be going in different directions. Some will be going in an adaptation direction and some will be going in a different direction and lots of public money at stake and private money at stake too. I think it would be to the benefit of the state to have an overall goal and plan for how we are going to deal with this. There will be some difficult trade offs – this is one of the most challenging issues I've ever started scratching the surface of.

Dr. Riggs: If I could just follow up then with the Chair and Mr. Givens, can this group make a recommendation to the Legislature as to how they should hold off on that particular bill until we get our heads around some of these ideas of hardening the shoreline. That's a pretty serious step right now that North Carolina is about to take.

Mr. Garrou: Absolutely we can do that – we will be making an interim report or we will be considering this among ourselves making an interim report to the Legislature for this short session and that can be one of the aspects absolutely.

Dr. Eggers: I just want to back up what Stan Riggs just said about hard stabilization and also beach Renourishment projects generally being such unwise use of taxpayer money to put it kindly and often is the case and probably a moratorium would be good. Sediment transport and all the long shore processes are complicated and it is hard for people to understand these but we should not run to stabilize our shores – that is not very feasible. Bill thank you for that presentation that was very good. When I think about what is going on at the coast and kind of business as usual approach and how fast houses are going up and I think all these should be at this point designed for this assembly or at least not maybe technically all the way designed for this assembly but designed in such a way that they can be taken apart and put on a truck and pulled back. That's what economically would be wiser – is there any place in here that would address US standards in terms of the recommendations from (inaudible)?

Mr. Holman: In the coastal area the Customary Management Act with the state and local partnership and actually when the Coastal Resources Commission adopted a rule in late 84 or early 85 banning sea walls at that time there was a little more room on the barrier islands. So there was a lot of moving structures back and because we've built out there, there are still some places where that are options but it is getting more challenging to retreat. Sea level is not just rising on the ocean front it is also raising on estuarine shoreline. Dr. Riggs knows more about the space available or the move of the barrier islands and that sort of thing. Those are difficult questions but if for example, you can generate maps that show if the sea level goes up a foot, here is what goes under water or here is what is more vulnerable to a storm surge and so you can identify more risky areas where property is going to be at risk and then you can begin to have that discussion on how do we respond to that. Do we have building retreat strategies or for some of our coastal towns, do we raise the seawall or something like that, not the seawall but bulkhead or that sort of thing. I think we need to begin the discussions about identifying those areas that are most at risk and then figuring out how we are going to respond. We will have to respond sooner or later and we would be better off responding with a thoughtful plan rather than reacting in a crisis like New Orleans is trying to do now.

Dr. Eggers: Your answer to this might be the same and if it is just say it is the same. It seems like one of the highest leverage approaches to really get the attention of public officials on the coast

with regard to the need to do something in the very real impacts that this will have and even in near term would be to have based on inundation maps of eight inches a foot for them to have to make plans for what they will do in response to the loss of local tax revenues and other revenues and how they will handle that. Is there any recommendation here that would tie directly into that?

Mr. Holman: No but this is a list of options and you can add and subtract as the Commission (inaudible). But those are good issues that you raised.

Ms. Tompkins: Could some of this be addressed through North Carolina real estate law some of these problems of construction and deconstruction and titles and sellers and buyers conveying the right maps and surveys and so forth. In other words North Carolina real estate law can be dovetailed with some of the new mappings.

Mr. Holman: Yes and the General Assembly could decide to require that kind of information to be disclosed or again making the maps more widely publicly available so that again people are making important decisions and taking that risk into account. And that is not just through the coastal area we've got flood plains all across North Carolina and if we have more intense storms we may see more localized flooding as well.

Ms. Tompkins: And also the insurance industry could be involved in that. I think they need to dovetail with the maps.

Mr. Holman: Yes I agree and I think it would be wise to at some point engage the insurance industry to learn more about how they're taking these risks into account and again I hope they'll be a real benefit to a hazard mitigation fund and rules and regulations and those sorts of things so that our history is every time we have a large storm everybody's property insurance goes up. We can do things to minimize risk perhaps we can also minimize those premium increases in the future.

Dr. Andrews: Bill thank you for a very valuable start on an important topic here. I am struck by a couple of things – one is the need for measures that are both proactive and reactive. That is a number of these are directed toward improving our capacity to respond to the particular events that are likely to become more frequent; but others are really touching a much deeper challenge which is how do we plan for a world, a future economy and a future state in which more of these sorts of things are likely to happen. And so I am wondering if you can say a little bit more about how we develop the institutional capacity to do that because you've touched on several key sectors here – the coast everything that goes with the coast to begin with. But I'm wondering whether there may not be deeper issues also in agricultural planning, in utilities planning because the trade offs that I believe Duke Energy for example is already facing between the use of reservoirs for power purposes and to save and drinking water. There are a number of cross sector interactions and I was wondering if you could say a little more than just the state and Environmental Policy Act with all its promised but all its limitations about how we might tackle those sorts of questions.

Mr. Holman: That's a great question – I can envision a role for the Department of Commerce and the university system and outreach to the business community and planning. There are some sectors that will be a lot more effective by climate change than others but we are making sure our folks are aware of the kinds of changes that scientists are forecasting. Certainly that is true in the agricultural area where we may need to work with our Department of Agriculture, NC State, A&T

State. We may see some crop shifts or may need to do some more research on drought tolerant plants and that sort of thing. This is one of the most challenging issues I've began to scratch the surface of so I am sure there are far more implications here than I am prepared to address and I hope others will speak up about their concerns and the kinds of things whether it's a program or outreach that the state needs to put in place so we can get ready for this change in our climate.

Mr. Garrou: Thank you Mr. Holman for your presentation.

Mr. Stephenson: I wanted to mention that the Climate Action Plan Advisory Group also looked at this topic and came up with one of the subgroups of that, that looked at cross-cutting issues in its report, and this is something that is not shrink wrapped which is why I wanted to bring it to the full Commission's attention. There were two preliminary recommendations that were made by the cross-cutting issues technical work group and a whole host of possible responses to any number of topics relative to adaptation including tropical storms, sea level rise, agricultural, forestry, fisheries, etc. The two preliminary recommendations I wanted to mention – one was to suggest that the General Assembly enact legislation to require sellers of coastal properties to disclose potential hazards to buyers, the coastal hazards disclosure should accompany all real estate transfers of property with ocean fronts, sounds or creek frontage in coastal counties. That is one that wasn't part of the presentation that Bill just gave us but I think it is one that's popped out during our interim report last year and the second is one that Bill did include, this last recommendation Bill referred to it as North Carolina Hazard Mitigation Fund. The recommendation of that cross-cutting issue group of the CAPAG was to create a coastal adaptation program that would be funded through a surcharge on the NC Beach Plan or some insurance surcharge. The funds would be targeted for the purchase of conservation easement on low lying coastal land but also for (inaudible) incentive with land owners for construction of ecologically beneficial for erosion control structures on estuarine shorelines which gets to a second recommendation that Bill brought forward. The problem that we have in North Carolina right now is approximately 30 miles of estuarine shoreline are bulk headed every year and that is an enormous amount of habitat that is lost to fisheries in our state. The other use of the fund the CAPAG cross-cutting issue group recommended was to use it for research to provide an assessment of the physical and ecological properties of the estuarine shoreline and potential cumulative impacts. I guess the one that pops out from the Institute for Environmental Policy Solutions report that they've shared with us today that I would like to see us bring forward as a priority is the establishment of a North Carolina Hazard Mitigation or Adaptation Fund and I hope that we will look at that more closely as we proceed.

Ms. Preyor: I thought Bill did a great job of giving a look at it and it jumped out to me but there are so many pools we have actually in place that we can target on this and that was very helpful and I would also note that it was a lot of focus on the coastal aspects of this and if we think more about presenting some ideas about a plan a sort of state wide look at adaptation that might include more of the land used and water supply issues that impact the Piedmont and west of our state, I think will be important to bring out too.

Mr. Garrou: Mr. Givens has a couple of things he wants to talk about.

Mr. Givens: I failed to mention several things. First of all, we welcome as a new member of this Commission Dr. Richard N. L. Pete Andrews. Dr. Andrews comes to us ex-officio as the designated Director of the Carolina Environmental Program at UNC Chapel Hill. Douglas

Crawford-Brown designated Dr. Andrews before he stepped down. So we welcome Dr. Andrews to our Commission. He has a distinction among many distinctions of having been the adviser for Jennifer Mundt our analyst. I had contacted him and got a very favorable recommendation which has been (inaudible) out so he comes with a great deal of credibility. The second thing I will note is we are going to distribute to you at this time this document which is a prepared by the US Climate Action Partnership (Exhibit D). This is provided to us by a member of the Commission, Jane Preyor. Let me reiterate our policy about distribution of documents – it has been my practice to distribute all documents tendered to me with the request that they be distributed generally without comment. You are free to distribute things among yourselves but if you go through the staff, then they will become part of the record and we will make sure everybody has a copy. Lastly, I need to let you know that there is a lot of work going on across the country with regard of what the role of the state should be in climate change in the next administration. Several of us have been involved in those discussions and I thought you ought to be aware. For example, at the beginning of last week our co-chair Representative Harrison and Brock Nicholson from the Division of Air Quality and I were at the PEW Center for Climate Change meeting on federal and state regulations. I am also involved with an effort by the Rockefeller brother's fund. I took Secretary Ross's place at a meeting on that so he and I have been coordinating about that. That is another effort – Brock is also involved with one through the Air Quality Directors Association nationwide. The Air Quality Directors are in communication with the Rockefeller fund group that is basically leadership states. I am pleased to note that North Carolina is regarded as a leadership state among the countries on this issue. All of which is to say that there are a number of efforts underway to figure out what the role of the state should be and what the state should want from the next executive in the next congress in this matter. Be happy to talk further with any of you, thank you Mr. Chairman.

Mr. Garrou: Welcome Dr. Andrews to the Commission. And now we're back to the original order of the agenda and we'll ask Tom Peterson if he would give us the presentation on the CAPAG report.

Mr. Peterson: I believe there are two handouts (Exhibit E) available one is a table a couple of pages long and two slides per page version of the power point. It didn't reproduce the detail obviously but the full version has in it and we will be referring to that version on the screen and we will do a walk through that as we go through the table one piece at a time. I am going to walk through the power point and refer to the table as we go along so we just have one handout and the full power point on the screen. The request that I am responding to is a consolidation of the CAPAG options - there were 50 some but a long list that fell into a number of different categories and have been consolidated in a set of categories that relate to implementation initiatives and they have been aggregated and the related outcomes associated with them that we will measure as part of the CAPAG process have also been aggregated so we have a profile for each of these and we'll take a quick look at the profiles of these as well as the overall structure. We still have the full detail where all the individual options that exist in the report and some of the data that I'll show you but this is essentially a summarized version that is structured in the direction of implementation initiatives. They obviously remain flexible based on the judgments that this group would make or others in terms of how best to structure this. So what I'm going to do is walk you through what we've put together and be happy to take questions and answers along the way if that's appropriate.

The categories that we've used for organizing the actions involved six major categories and if you count them up one by one, I think we've got nine, but the first category is heat and power and this is a combination of energy demand or demand side reduction actions on one hand and then supply side actions on the other hand. The demand side actions being called energy efficiency and conservation and the supply side actions called clean and renewable energy. These again relate to what sometimes is referred to as the stationary source sector residential, industrial and commercial but it is both the generation and the use of energy as well as other processes that occur in these stationary source sectors. The second flip side of that coin often called the mobile source sector – transportation and land use. A similar breakdown originally I had one single category for the demand side actions and then split that in two pieces because it seemed evident that they were both substantial enough and different enough that they deserved that. So the first category is location efficiency which deals with land use issues, development infrastructure, etc. Things that have the potential effect of reducing or depending on how it is managed increasing travel demand. The second is vehicle operations which relates to the design and the use of vehicles whether it is café standards, clean car standards, slow rolling resistance tires, etc. A series of actions oriented towards reducing the emission of greenhouse gases from vehicles during their operation. And the last category in this set relates to the use of fuel and its carbon content and this supply category for fuels includes things like ethanol for instance but it is a supply side category that's oriented towards liquid fuels used in mobile source sector. Those are the two big categories and then following them and based on the recommendations of the CAPAG are a couple of other key categories. The first being a collection of things that relate to agriculture and forestry – they are predominantly oriented towards land protection measures, whether it's restoration and recovery or protection from lost. There is a minor action included in that relating to soil/carbon buildup which we've labeled conservation practices but they've been lumped together. Just so you know, originally in looking at this we had structured this so that there were two separate categories, one for land protection and the second for conservation practices. In North Carolina there was only one option for conservation practices. It was rather small in terms of its scaling so we simply lumped that together in one generic category here. The next category is waste recovery and recycling which relates to either direct recycling of materials or recovery of energy from waste and reuse of energy.

The next category includes a couple of different actions in the state that we've labeled state and local government. We'll walk through that in more detail, but this relates on one hand to a series of information, education, outreach initiatives that the CAPAG group had identified. On the other hand a series of what we've termed planning and capacity building measures which relate to measurement systems and inventories report and registry as well as goals and targets. The final category is adaptation which is a separate track. Bill Holman has provided a very helpful briefing on some of the key issues there and as a parenthetical note on the adaptation recommendation that CAPAG has is a separate appendix in the report that maps that out in quite a bit of detail. These are categories that were structured really as a first step towards identifying what would be dramatically, organizational, institutionally logical initiatives that could be used for actual implementation. Obviously there are a lot of different ways that you could slice and dice and lump and split the recommendations that came out of the CAPAG process. I would say that this is a fairly typical rendition although it is a little bit different as it is in every state due to the unique characteristics of the North Carolina process. Before we begin the walk through I sould ask if you have any general big picture of comments in terms of the structuring of this?

Representative Underhill: Thank you Mr. Chair. Will your power point be available to us online?

Mr. Givens: It is our normal practice to make documents available. We have a web page – we will try to post them.

Ms. Tompkins: Thank you Brock. Could you tell me what are the unique characteristics of the North Carolina process? Simply put.

Mr. Peterson: Sure. We're working in Iowa right now. Twenty-five percent of the emissions in the state of Iowa are directly attributable to agricultural practices. It is very different in North Carolina which is a much smaller number. In all likelihood in Iowa the percentage of reductions at the end of the day that will come out soil/carbon buildup practices will be very, very high. It's a low number in North Carolina. That's just one example – there are lots of differences substantially between the states – the mix of renewable, the level of efficiency opportunities that exist and those are very much reflected in the recommendations that came out of the CAPAG process.

Ms. Tompkins: What is the biggest one for North Carolina?

Mr. Peterson: The biggest in terms of?

Ms. Tompkins: Characteristic that is defining and shaping these categories.

Mr. Peterson: I would say the number one characteristic in North Carolina is in the category of being a high growth state. It is in the top tier of gross rates and emissions and that of course is reflective of growth rates in terms of the economy and population and etc. That changes the nature of both the problem and the potential solutions. It is depending on which measure you use which accounting system either 88 percent or 106 percent, but just roughly when you're knocking at the door of 100 percent growth rate through the 1990 to 2020 period that is getting into the top tier or the top third of the growth rates at stake. The low end you see a state like Pennsylvania all the way down to 13 percent.

The curves that you have in front of you on the screen is a color coded version and a label version of the supply curve that we shared with you at the last meeting. This is one that we've been able to tease out in more detail and categorize and each of the colors on this curve corresponds to one of the categories that we've seen on the slide before. This actually includes an earlier split out that we lumped back together that has the farm and forest conservation practices split out separately. It also has another category that we looked at that is not large in size but we thought might possibly be important for other reason which is state and local government lead by example actions. They are currently folded into the heat and power sector and the transportation sector but we did some pull outs just so you could see what that might look like. This is the same set of categories we went through on the slide before and you can see how they map out in terms of their importance to the tonnage reductions in achieving some total level of reductions and then you can see by looking at the left hand axis the estimated cost savings per ton. So again the height of that step corresponds to the price tag and the horizontal stretch of it corresponds to how many tons are potentially available from that action area. This is a combination of costs per ton and supply potential in a stepwise cost function.

We saw the McKenzie supply curve at the last meeting as well. That is similar in structure and this is split out in steps the same way. I would also just note in the bottom axis we have a number of percentage numbers go from 0 to 50. This is the percentage reduction beneath BAU business as usual baseline emissions in 2020. So you go all the way out to the far right and at the 1990 level where we have an arrow that is approximately a 47 percent drop below BAU business as usual in 2020 and that would return North Carolina emissions to 1990 levels. That tops out on the high end at roughly $25 a ton. You slide back all the way to the arrow that says 2000 that is a 30 percent drop below business as usual and that would get you back to 2000 levels. In terms of the establishment of goals and targets they typically have been structured in terms of an index year say 1990 and then a future year and a percentage reduction target against that and so we see that here just for purposes of illustration I put 1990 and 2000. That can be converted to a percentage drop below business as usual which is the bottom axis there. We have not pulled together the benchmarks from other states in terms of the percentage drop below BAU. That is easy enough to do but they cluster somewhere below the low 30's to the high 40's. The low to upper 30's tend to be typical of northeast and west coast states the coastal economies and the higher percentage drops tends to be associated with higher growth states, primarily because of energy efficiency opportunities. Again two different ways to look at targets, the percentage you drop beneath the projected baseline and then the anchor point, the start year and then the index point that you need to get to beneath that. We are not going to spend a lot of time in terms of slide presentations, goals and targets but I did want to connect the dots in terms of the how mathematics of that are derived.

I color coded the general categories we went through earlier and profiled their total contribution to the reductions that were identified through the CAPAG process so you can see their percentage of importance just based on the greenhouse gas reduction potential. And going from the red bar on the left all the way to the green on the right you can see their ranking. The first two are in the heat and power sector, the first dealing with efficiency and the second dealing with the supply side issues. And we get into three bars that deal with transportation – the first is location efficiency, the second is vehicle operation improvements and then the third is the transportation fuels category. The next is land protection and conservation – the vast majority of which you will see in a minute is in the land protection and restoration category, then the final smallest category with waste recovery. These are aggregations of the options and certainly judgment calls have been made in terms of this particular format but this gives you some sense of the relative importance of these schematic areas. We also have information for their cost or cost savings per ton and that moves from left to right with the red bars going beneath zero that means the potential costs savings. The yellow bar going above zero which means potential net costs and we work our way across and see that we have the most significant cost savings opportunities on the efficiency side for stationary sources. And then vehicle operation improvements the judgment call by the group and we made an additional judgment call on location efficiency was partially quantified that we don't have a cost per ton figure here. Some qualitative decision that was made on some of the major issues they were to note that they are expected to have a net savings level that is significant but not fully quantified so on this slide we don't have a figure for location efficiency but it would be expected to be a savings.

Finally in this upfront profile we see total cost or cost savings estimated and I may have actually made an error in the 2007-2020 year and I think it is actually 2008 in term of the calculations that were used. But this is the net present value of either direct costs or direct savings associated with

the actions in these categories. Some of them expected to achieve significant net savings others would involve significant net costs. I am not going to spend too much time on the next two graphs except to note that the supply curve, this is another rendition of the supply curve which is just cost per ton and all of the different options in the CAPAG can be placed on that curve and categorized so that the supply curve that we showed at the outset is a combination of this data. Then the next slide as well which shows the greenhouse gas reduction potential and individual options. Again they have been categorized but certainly important to note that the very first option here ES2 portfolio standard has already been the subject of legislative agreement and has been signed into law. In this analysis the option that is shown here actually is for a scenario that would go above and beyond that and it I think raises an important point to bear in mind as we go forward and that is the certain amount of actions has already occurred in the recent few months and it's likely to occur this year. We are seeing some reduction already of emissions in North Carolina either from federal or state action and that is likely to continue and be a factor in planning going forward. Just so you know some other key things that are not included in this analysis because of the timing of the CAPAG process – the numbers that we've developed do not include the impact of the recent federal energy legislation which includes some important energy efficiency measures. Incandescent light bulb standards effectively a phase out and the new automobile standards café some other key things and we're in the process of producing updates from recent federal actions and translating them into the impacts on the overall forecast of emissions for all states and including North Carolina. Clearly they will have a depressing effect on the overall growth rate but they are not included in what I'm showing you today.

The first category heat and power – what we see here is a yellow and a red wedge against the economy wide growth on emissions from 1990 to 2020 so you see very significant reduction potential associated with both of these areas. Again just to note, the portfolio standard has already begun implementation of a significant slice above because of the structure of that particular standard. We profiled the potential for the individual CAPAG options that are included in these two categories and label them so you can see what's inside the box and how that fits together. These are all schematically similar in terms of being demand side actions but certainly there are some differences between them. But this is what is what is in the red box if you will. Cost per ton cost or cost savings this is one that shows a number of cost savings measures that came out of the process the energy efficiency and conservation arena for heat and power. Again this is reflected in the summary supply curve we showed at the very beginning.

The next set are the supply side actions in heat and power which involve a series of actions that have been labeled here that deal with the reduction and emissions associated with the production of energy whether it is generation of electricity or direct fuel that are used for buildings manufacturing, industrial processes, residential use etc. The big ticket one that stands out on the far left is the portfolio standard. We have the cost savings profiled for this set it's a combination of a few that are expected to yield cost savings and others that are expected to be on that positive cost. We pulled out just for purposes of illustration to lead by example actions for - I believe these were state government as opposed to local government but they include both energy efficiency requirements for (inaudible) green power purchasing. Obviously, the design of these individual options varies depending on what they are – some are oriented towards public agencies and state and local government and others towards the private sector. So this is just one illustration of being able to pull out one set of things that relate to one set of end use implementation. Cost per ton

here again the efficiency measures expected to result in significant cost savings and the positive cost associated with green power purchasing.

The next category is transportation and working our way down from the top. The top slice is the fuels category, clean and renewable fuels, the next slice is vehicle operations improvements and the next one is location efficiency. Pretty significant when you add these up in terms of overall emissions reductions. The profile here shows big ticket items in terms of land use practices and (inaudible) transportation, etc. but it is a collection of very big items and then some smaller items. Then the cost per ton, the estimates here are potential savings and again there were some fairly significant discussion about exactly how to handle quantification for some of these so that's carefully worded in the text of the report and reflected in the numbers.

The next category which is improvements and vehicle operations shows on the left the California Clean Car Standards and Diesel Retrofits and a much smaller category with Idle Reduction. That first category is important to note that since the process concluded we've seen federal legislation paths for a new café standard and it was certainly the result in a portion of that set of estimated reductions happening under federal law. The estimated costs or costs savings associated with these, actually looks like this draft didn't work right, this is a repeat of the previous draft. My apologies, we are missing the costs per ton data but I can look that up. In the fuels category the graph is missing for that also. We can go to the data and get the profile on that as well.

The Farm and Forest Conservation category you see a blue wedge here that deals with land protection and you really can't see the smaller wedge dealing with soil carbon because it is so small which doesn't mean it is unimportant, it certainly was important enough within the CAPAG process to become a final recommendation. But the Land Protection category is responsible for roughly ten percent of the CAPAG reductions – this is consistent with national averages in terms of the estimated potential for terrestrial sequestration from these kinds of activities. A profile again we see on the left the forest protection, forest enhancement measures are much higher ranking than the bar on the far right which is the preservation of agricultural work land. Then the cost per ton is also high for that last measure of the agricultural working lands. So it happens to be one that is both low in potential and relatively high in terms of costs but again not necessarily indicating that it is not a priority.

Recovery and Recycling is a smaller wedge and deals with the combination of land fill methane and biomass energy recovery programs and manure digesters and then recycling infrastructure and collection. The first two are oriented toward waste energy recapture. The cost profile here shows pretty significant difference with the manure digester options. This may well be one that fits into the category of having significant co-benefits because of waste reduction and the process of setting priorities and making final recommendations. Co-benefits and co-costs were one of the design criteria and decision criteria that the group could consider and this is one where that was important. The final graph is just going back to where we started from originally in the CAPAG process which was looking at the approach to the working group structure and the policy actions by economic sector and we've rearranged that a little bit based on the actual outcomes of the process but it tracks roughly with the overall sector breakdown. Again, some differences a little bit more splitting and then you can see the relative magnitude of the CAPAG recommendations against 1990. The recommendations would not quite return emissions back to 1990 levels but relatively close. The table that we've put together as a back up for this provides the same profiling and a

little bit more detail in terms it lists the specific CAPAG component actions that are in each of these action areas and the tonnage reduction potential costs savings cost and cost per ton. We've also added an additional metric year in response to a request that comes up very frequently which is an energy savings calculation and so we've listed that where it is applicable. You can see on the first item heat and power 1A Energy Efficiency and Conservation the estimates in terms of BTU's and giga watts per year, etc. That is one additional piece of information that we pulled out of the data in the full report. The final column here is a set of notes that relates to potentially key issues that would need to be considered in formulating either legislative or administrative action in implementing this action area. That is the overall brief.

Mr. Garrou: Thank you. Questions?

Ms. Preyor: Thanks so much for trying to pull this together in a new way for us to look at it. I just want to play back and see if I understand? If I say to myself, one of the questions that the Chairs have said to us, you know it's narrowing down, is this correct what your charts are saying that if I had to name the top four categories to get the most greenhouse gas reductions and how they relate to cost, is this what I heard that #1 in reductions and in costs savings is efficiency, #2 in reductions was the renewable energy but there were a lot of high costs on that one and that one is underway to some degree now; 3rd and 4th were transportation and the land protection category and they had a mix and a range of costs savings and ones that had positive costs and that the mix in there you can pick and chose on (inaudible). Is that a fair real lay person's look at that?

Mr. Peterson: Sure. This is a mixture but right off the bat in terms of where the tons are the stationary and mobile source sector, not surprisingly is where the tons are. And not insignificant are the tons that come along with land protection and conservation area but that is the short story on where the tonnage reductions are. The costs or cost savings map out generally but not exclusively following the man side reductions which is the net which is very important are the ones that show typically the highest potential for cost savings. The supply side actions are the ones that generally show some sort of positive costs. Obviously when you package them both together you are able to balance that out. The other important thing is that many of these options were structured deliberately anticipating that there would be integration within the sector of supply and demand side issues. So these were not envisioned as being entirely stand alone and one of the things we struggle a little bit with in putting this together was splitting out the demand and supply side for the sectors because they were really viewed in a much more integrated fashion in terms of actual implementation.

Representative Harrison: I don't mind asking stupid questions. Can we go to the last slide? I'm having a hard time understanding precisely what on the emissions reductions and you're talking metric tons of carbon emissions?

Mr. Peterson: These are equivalent so this would include not only carbon dioxide but methane (inaudible) and then the synthetic acids so this is all the gases that are recognized internationally and nationally.

Representative Harrison: So we don't have that translated into how it is going to work out as far as the parts per million, the 385 figure or their correlation?

Mr. Peterson: If the goal is to achieve 450 parts per million by 2050 or some point in the future which is certainly one of the recognized and now scientifically recommended benchmarks in terms of getting there from here. The question is whether any early benchmarks like 1990 levels by 2020 or 2000 levels by 2020 whatever it is, is on the pathway for stabilization for whatever that jurisdiction is. This is clearly on that pathway although if we were to stretch the right side of this from 2020 all the way out to 2050 you would see that this would need to go down fairly steeply in the arena of 70 percent maybe 80 percent reductions against 1990 or 2000 levels. So it would need to slope even further down but this is a pretty consistent level of effort in terms of being in a position to achieve the longer term reductions.

Representative Harrison: So that has a strongest reductions you mean?

Mr. Peterson: This kind of level of effort certainly has been viewed as consistent with that yes.

Dr. Andrews: Is there a background report that is available to us that that includes a little bit more of the detail about what specifically makes up each of the wedges? Each of these pieces clearly has assumptions behind it about how you achieve that full level that you are assuming we'll get to.

Mr. Peterson: If you will go to the project website for the CAPAG which is ncclimatechange.us the draft final report is posted with a series of chapters and appendices. They go into all of those details and the appendices contain the long form of the write ups for the individual policies and all of the details that was associated with that and that's many hundreds of pages but you can zoom in on any particular individual action and it is there. What we've got here is aggregated that detail, the write up is something a little bit more summary oriented.

Mr. Garrou: Dr. Andrews you missed the part where we got all the detail and asked for this. Other questions of Mr. Peterson? Thanks very much this was a good summary of what we've seen and I think this will be helpful to the Commission. Our next speaker is Mack Pearsall who is an Advisory Board Member of the Centers for Environmental and Climatic Interactions. Thank you for coming Mr. Pearsall.

Mr. Pearsall: Thank you Co-Chairs Garrou and Harrison for the opportunity to appear before the Commission. I am a member of a group of that called CC which is the Center for Environmental and Climatic Interaction and I provide user incentive for environmental and climatic interaction. It is a 501 C3 based in Asheville. You probably heard from me a month or so ago when we couldn't get on your agenda I sent you a CD about climate alive which really tells you a lot about what's happening in Asheville. But I want to bring it down to more of a street level and share with you what we're doing in Asheville and I want to bring you a proposal about how to get the water to the end of the road so to speak in terms of climate change and the measurement of particularly mitigation and adaptation opportunities for cities in North Carolina with Asheville potentially taking that lead. Now I am passing out a notebook here (Exhibit F) and I will simply direct first your attention to the cover of it which we see climate change, we've adapted to the fact that climate change is a scientific fact and we see this big red cloud over top of may the earth with somebody sleeping in quite repose and it is something that we've got to deal with. And we are going to propose to you what I call the creation of the North Carolina Green Cities Plan. I am going to ask you in a moment to turn to the Executive Summary page and from then on I am going to direct you to the appendices and very quickly try to document the reasons we are proposing it. We went back

and researched the basis for your being and under your duties and responsibilities I find under Section 5D an evaluation of economic opportunities for the state and they result in the international and national and state actions on to address climate change and emerging global carbon market. I am here today to talk about that so if you would turn with me to tab 1 and I want to tell you where we are in Asheville and why we are there. We are in the part of the state where we've lost tremendous number of manufacturing jobs. We've been trying to find a position in the 21st century that wasn't offshore that was authentic and was organic to us and the one that we could leverage with a sustainable competitive advantage and the Asheville hub was created as a catalytic group to find those particular opportunities. And we found a lot of opportunities another one we're working on beyond climate is the area rejuvenation and the integration of complementary and (inaudible) medicine which again comes back to part of what we're doing here in dealing with climate. What I am here to talk to you about today is what we're doing at CC in terms of this climate interaction. We realize we couldn't do it by ourselves so if you would turn to tab 2 and turn your notebook sideways and look at exhibit A. You will see that we have been building relationships with a lot of people and in fact I just came from Erskine Bowles' office. When I was there with the head of the NOAA operation here in North Carolina, NCDC I was there with people from Oakridge National Laboratory, I was there with all of Erskine's people who are planning their curriculum and looking for their graduate programs and all of that. We've got a relationships wherever you see a star in a box we already have an existing relationship with that. One of these you may well know about is the RENCI engagement site which comes through UNC-Chapel Hill. I'll talk about that as a way to anticipate and plan for interactions against catastrophes. But we've had to go to a lot of different places and we happen to have those relationships naturally in place – Oakridge is very close to Asheville. We already have an engagement with them through our AB Tech. The NOAA we have the National Climatic Data Center there and we have the US Forest Service. We are working at their special lab in doing a lot of research and modeling. We have a lot of private sector companies that are coming to Asheville to monitor weather and say how do you monitor it, how do you take it and turn it into something that is market driven that people want to buy the results of your information. And we think that the Department of Energy over at Oakridge and the Department of Defense in many areas have now been mandated to find out they have got to plan climatic interventions or climatic situations into their planning processes. We have a lot of local activities – well that's a relationship we couldn't do by ourselves.

Now the relationship we are talking about with you and what we are proposing, if you will go back to the first page and then we'll go to Appendix A1. We would like to propose to you this, the establishment of a partnership with the state of North Carolina, the University of North Carolina, the Nicholas Institute of Environmental Solutions, national foundations and others to develop and establish a North Carolina green cities plan to initiate test and validate climate change management initiatives and urban climate environment and to designate Asheville as that prototype place where it should be started. I'll give you the reason we think that which will help to solidify our position in the National Climate Change market. Now climate change is affecting everybody's life. What DOD is very concerned about it and when we're talking to people in Europe about moving vineyards north because they know they will not be able to grow grapes in a certain part of the world it affects everybody's life. Now what do we have in Asheville going on? We got the National Climatological Data Center that has six decades of records on daily information coming in from all over the world and the United States about what's happening in climate. We have nine Noble Peace prize winners who are at the International Panel on Climate Change, the one for which Al Gore won his Nobel Peace prize, this intellectual capital that we find at Asheville

and we plan to make use of that intellectual capital and the assets of NCDC and that data base there. Now there are people all over the world who are predicting tragic circumstances and the time to intervene is now. We believe also that the time is now to act because we know there is going to be a lot of federal money spent on research in the climate change area. We had the National Climate Change Data Users Conference in November and over 200 people were there. We had re-insurers, we had transportation people and we also had energy people. It is amazing how those people are concerned about what is happening in their industry. I never thought on transportation but I drove into that storm last night from Asheville and I don't know if you believe in climate change, whether it was coincidental or not but what they are telling us is we are going to get the same levels of precipitation but it is going to come in much steeper peaks like that and when spike in heating and fighting cold it will call early metal fatigue in bridges. Who would have ever thought about the climate change implications from that type of thing? We had that users' conference there and the market is going to be unbelievable. Now it is one reason we are all struggling with exactly how it is going to come about because it is a brand new market and there are a lot of unknowns in it. But we know there is a great desire for an honest broker of climate information. As an attorney I can tell you I can buy conversation and information expert testimony on either side of the case but I'm telling you these people are in industries where they are trying to make long term and capital investments and they don't want to be off the mark in making it. If you're going to give them that type of information you need highly sophisticated scientific input and you are also going to need different types of technicians. How big is the market? Right now it is a 2-4 billion dollar market; in ten years we think it will be a 10 billion dollar market in less than ten years and we think there will be a 500 billion dollar private sector spin off and that is where Asheville is trying to position itself.

Now if you will look back to the Appendices look at Exhibit B. These are predictions that have been made by our experts on the type of money that is going to roll out of this entire industry as a development – a brand new industry. The only thing that I would point out here is I don't understand all of the sophistication behind these formulas but at the bottom next to the last dot that says weather affects only 30 percent of the GMP but climate affects 100 percent of the GMP. Exhibit B, Appendix B is behind Section 2, Tab 2 and the Appendices are alphabetical. This substantiates what we think will be the gross of the industry and how much it is going to mean to a community that is trying to find a position in that market. We need to act now because there are others who are involved in this. Colorado is involved in this, Maryland is involved in it and others are attempting to get involved in the cold climate change management initiative and the management of that data. We've chosen specific markets for Asheville – one of our specific markets is to take climate change data and model it for public policy decision makers at the state and local level. This would be cities and counties that say what would this information mean to me in terms of what type of policies I should be initiating? Well if you look over at C and C1 in the Appendices you want to know why I say it should be done in Asheville.

We've been about it for five years folks, we've already had this HUB organization that's a catalytic organization, we've got the Center for Environmental and Climate Interaction because they already actualized our plan for North Carolina Aubrietrium and taking a lead in it we've got our own education research program going. We've got an applied visualization lab – our concept is that people are not literate they're alliterate – they would rather see a picture than they had to see very complex scientific data and if you're going to convince people as a reason for change in the way they behave or to understand something from a policy standpoint, you are going to have to paint

them a picture. We've got a growing media arts community that is basically our ability to merge the media artists with the computer artists and to convey that particular story. So we've got great opportunities going – we've not been asleep if you look at Section C1 Why Asheville should do it – why Asheville should be chosen as the boggy. If you will look here under C1 there are 78 reasons why Asheville should be chosen. You start off with our municipal situation where we are member of the cool cities agreement, one of the first people on the east coast to do that. We are members of ICLEI we are the only city on the east that has a Gold Leed standard for all of our municipal buildings. We've entered into carbon reduction agreements. We've got the (inaudible) engagement site with a decision wall and a completely immersive environment which we think is a new economy approach to teaching climate change and issues. We've had NOAA come in two weeks ago and said you are doing exactly with climate change information what you need to do to be sold to the market place. What we're doing is market driven – if you are familiar with GIS actives and (inaudible) the president of (inaudible) is very intrigued with what is happening in Asheville. He is coming to Asheville to see what we're doing because he thinks that type of information should be rolled nation wide.

We pride the greenest city but you are not going to find many cites in the state that are making eating utensils out of potatoes. We are in to all sorts of green things we have the Green Building Council We have our own American Green TV You Tube, (inaudible) Company that is started in Asheville. We have over 80 green buildings - the Biltmore House has initiated all sorts of green initiatives. We are home to the organic growers' school. We got an eco agents' deal for our realtors. Folks we are green and there are 78 reasons in there that will tell you why Asheville should be chosen as the place to initiate this plan. We haven't been asleep, look at D we've been planning this for years and it is finally coming to fruition. Even this morning as we speak, there is not going to be one National Climate Center, there is going to be a National Climate Services Network – Asheville intends through NCDC and through our civic efforts to make us a large node on that particular network and we're choosing visualization, policy making data and we are also have relationships with the Department of Energy and the Department of Defense. There is 74 million dollars in the federal budget, 3.4 million which is going to come to Asheville to manage a satellite operations program for earth observation. What is happening is the scientific part of this observation is over and now we need to move into the measurement of earth observation data for the purpose in terms of mitigation and adaptation procedures. So I come to the bottom and I say ok again we want to establish the partnership with the state of North Carolina, national foundations and others to develop a green city plan to test and validate management initiatives and urban climate environment and have Asheville designated to (inaudible). It is going to be a lot of snake oil, folks are going to be asked to do this and do that, we think we have the environment with the potential for the International Climatological Data Center to measure our intervention and validate it and be a place that people can come and be instructed on how to take the information that is in the academy and get it to the end of the road where it makes a real difference in real people's lives.

All that said, if you will flip over to Tab 3 I think there is a pit factor. I think it is a pit factor in Asheville and that it has a national bug about it and if you'll look at the PR pieces that we have behind there about how Asheville has become a venue for climate change. Our politics is liberal enough where we can undertake this type of thing and small enough and the last thing to be designated as that particular city where we try the green cities program would fit us because that is what we are. We are sustainable and we live in that world. I was just given this morning out of Popular Science America's 50 green states. Greensboro is the last one listed on there the best

one is in Oregon. They measure it in different ways from transportation to energy use to all sorts of other forms of reductions. What I say to you is we propose that we take all of the findings that you come up with and create an actual plan to get the water to the end of the road and we propose that Asheville will be that place and volunteer to serve with you and we have an action plan here. If you will look at Appendix F in item 3, the last thing in item 3, we are recommending that this Commission help us create the clean cities plan to encourage all cites in this state to work on reduction of greenhouse gases. We are hoping that you will encourage the Legislature to appropriate funds to create an urban green lab and that Asheville will be designated as that. We are committing ourselves politically to get our delegation behind it because we think that the science needs to be moved to the street where action can take place and we can change people's lives and change the impact through adaptation or through mitigation. That is our proposition and I hope you will do something with it. Put it in your records but we're here to let you know that we're a player in the climate change industry and we're already off and gone. We staked that territory out and we're actualizing on it and we think that in North Carolina if we're going to make a difference in the greenhouse emissions in the cities perhaps a green cities program would be the way to do it and we would offer ourselves as a candidate for that proposition.

Mr. Garrou: Thank you Mr. Pearsall. Questions? Thank you very much for that presentation.

Mr. Pearsall: Thank you and the books are being handed out and we'll leave extra books with the secretaries to give out.

Mr. Garrou: Before I open the floor for any discussion let me suggest to you what Chairman Harrison and I consider to be the agenda for the next two meetings. The first will be to consider whether and in what form to recommend a statewide goal for greenhouse gas emissions reduction. The second would be whether and to what extent to adopt the final CAPAG report as the position of the Commission. And the third would be to consider whether to recommend to the Legislature in the short session any particular form of legislation. The next two meetings in our view should be devoted to those three categories for action. Discussion?

Representative Underhill: Thank you Mr. Chairman and also Chairman Harrison. I think this is a point where we do need to seriously assess the information that has been provided to us and provide the Legislators who are serving on this Commission with a plan of how we want to proceed in the short session and then in the long term reinstating ourselves for another year for the long session where further legislation can be proposed. We have a lot of things that has been presented to us and I think we need to prioritize the key most vulnerable things that we need to do first. Since I fit in a district that may be under water some day soon from what I'm hearing I certainly am extremely concerned with the adaptation items we were presented today. But Dr. Riggs has said over and over and I would particularly want us to have some sort of strategy to begin to address adaptation and sea level change. I do not diminish the importance of all of these other things but we're really moving forward quickly the state is embracing the importance of greenhouse gas emissions on all the reductions of that waste. I don't believe that people in the state and even people in the east where I live understand the importance of what could happen in the next 50 to 100 years. With a very critically important economic driver in our state historically and I really want to reiterate how important I think this is for us to concentrate in this first wave of information to the General Assembly what Dr. Riggs has brought forward today particularly with the

piece of legislation that we will be faced with addressing immediately when we get there how do you deal with (inaudible). Thank you.

Mr. Garrou: Thank you – other questions or statements? If not we are adjourned and will see you next time. Thank you very much. Let me remind you to turn in your expense reports.

Meeting adjourned at noon.

Respectfully submitted,

Mr. John Garrou
Co-Chair

Thelma T. Utley
Committee Clerk

APPENDICES

Exhibit A	Visitor Registration Sheets
Exhibit B	Agenda
Exhibit C	Memorandum (Nicholas Institute for Environmental Policy Solutions) Duke University
Exhibit D	A Call For Action – Jane Preyor
Exhibit E	Draft Consolidated CAPAG Options – Tom Peterson
Exhibit F	The North Carolina Green Cities Plan – Mark Pearsall