JOINT LEGISLATIVE COMMISSION ON ENERGY POLICY
April 1, 2014
Room 643 Legislative Office Building

The Joint Legislative Commission on Energy Policy met on Tuesday, April 1 at 1:00 PM. The meeting was held in Room 643 of the Legislative Office Building in Raleigh. Senator Bob Rucho presided. All documents and presentations are available on the Commission's website.

Members present were: Senator Bob Rucho, Chair, Representative Mike Hager, Chair, Senator Andrew Brock, Senator Kathy Harrington, Senator Gene McLaurin, Senator Ronald Rabin, Senator Trudy Wade, Senator E.S. (Buck) Newton, Representative Rick Catlin, Representative Ken Goodman, and Representative Mike Stone. Dr. Jeff Warren, Senate Senior Policy Advisor; Andy Munn, House Senior Policy Advisor; Ms. Jennifer McGinnis, Mr. Peter Ledford, and Mr. Jeff Cherry, Commission Counsels; Ms. Jennifer Mundt, Commission Analyst, Lindsey Dowling and William Verbiest, Commission Clerks.

Call to order and introductory remarks

Senator Rucho called the meeting to order at 1:11 PM and welcomed members, staff, and visitors in attendance. Representative Mike Hager spoke to Duke Energy and Piedmont Natural Gas's joint venture to build a new gas pipeline. Senator Rucho introduced the Sergeants-At-Arms, Young Bae, Patrick Mason, Charles Harper, and Ed Kesler.

Approval of Minutes

Senator Andrew Brock motioned for approval of the minutes for the Joint Legislative Commission on Energy Policy for the meeting of March 4th, 2014. The vote was unanimous in favor of their approval.

"The Economic Potential from Developing North Carolina's On-Shore and Off-Shore Energy Resources"

Senator Rucho introduced Dr. Michael L. Walden, Professor with the Department of Agriculture and Resource Economics at NC State University who presented the report "The Economic Potential from Developing North Carolina's On-Shore and Off-Shore Energy Resources" Following his presentation (*4 – Walden – Economic Potential from Developing North Carolina's On-Shore and Off-Shore Energy Resources, 4a – Walden – Economics of Energy Resources*), Senator Rucho opened the floor to questions at 1:35 PM.

QUESTION AND ANSWER

Senator Brock: Dr. Walden, looking at some of your estimated impacts and a lot of this of course is based on the supply of it. What information did you use for the supply that we have of on-shore, our supply, our reserve?

Dr. Walden: US Geological Service.

Senator Brock: OK, which is about 1.7?

Dr. Walden: I don't keep all those numbers in my head, but it's in that range.

Senator Brock: Looking at some of those numbers, some reports were looking at those numbers from the US Geological Service are pretty low and that it could be much higher, in fact up to 10 times if not more.

Representative Goodman: You mentioned the low probability of an oil spill or something off the coast. Do you have a number; can you quantify that low probability?

Dr. Walden: I can provide that to you, actually it might be in the report.

Representative Goodman: Whatever that number is, is that for one year or is it over a period of time?

Dr. Walden: You can annualize it and this was based on, I believe, looking at spills over the last 40 years and quantity of spill, etc.

Representative Goodman: Thank you and you'll get us the information.

Senator Newton: My question, if I could, the assumptions that you use on the off-shore drilling, do they take into account that the – and I'm not sure if they do or not – do they take into account that most of the estimates are going to be for natural gas as opposed to petroleum?

Dr. Walden: The quantities I used were for both, included both.

Senator Newton: If it were to turn out to be true that most of the resource were natural gas, would that significantly change your – I mean the damage from a natural gas spill would be quite different, wouldn't it, from an oil spill?

Dr. Walden: Yes.

Senator Newton: Follow up, moving to the portion where are dealing with the on-shore development and residential property values. What were the periods of time that these values were measured? Can you remember what kind of bookends there were to the years?

Dr. Walden: Again, my answer would be subject to revision when I actually go and look those numbers up for you. But I think we're talking about within years from the start of the development.

Senator Newton: What I'm trying to get at is are we talking about from the late 90s or the early 2000s or the late 2000s, that's what I'm trying to get at.

Dr. Walden: These are all things that have been published recently; do you have a copy of the full report?

Senator Newton: I do, I was reading through it but I couldn't tell when those studies were.

Dr. Walden: Again, I'll have to go back and look for you but I believe and I stand to be corrected, I believe the data are for a rather recent period.

Senator Newton: On this same area and you can probably guess where one of my questions was going, due to the economic downturn we've had and that obviously so many places have had a decrease in property values unrelated to this development. In the study, your report indicated that the study had controlled for other variables. Could you enlighten us how they can control for that?

Dr. Walden: One thing you can do is to have a variable that measure the broad condition of the economy and of the local economy and if you have enough of a variation in that, that can capture that.

Representative Stone: Just wanted to make a statement. Listening to some of the questions – and thank you Dr. Walden, great presentation, I enjoyed it – this is why the rules are so important

cause when I'm reading and listening to this presentation, we have a low side and a high side of what we expect to see coming, our way in the future. I think we all know that we don't have a clue in North Carolina what is below that ground, so our job becomes extremely important to make sure we have the best rules in place as we move forward. I mentioned it when I was in Pennsylvania that is exactly what happened. The USGS had come out with one and I think it was 10 times the amount and I asked that question in Pennsylvania, they always give you a very conservative number. So I'm sure we can expect the same in North Carolina, a very conservative number. But it just makes it that much more important as we move forward to make sure that we have the right rules in place and let the free market work.

Senator Wade: Thank you for your presentation. I've been paying special attention to North Dakota and I noticed that their unemployment rate was 2.7% and they're having an influx of population growth that is unbelievable. Their housing market certainly isn't suffering, in fact they can't find places to stay and it has made the market skyrocket and the average salary there is about $100,000 and they can't even find fast food workers to take those jobs. Do you foresee anything like that in North Carolina, if we actually do have natural gas or oil that is available? Do you see anything that would stimulate our economy like that?

Dr. Walden: Well, when I gave you the numbers I tried to put it in context for the size of our labor force and the number of people unemployed and based on the numbers that I presented and of course as Senator Brock and others have indicated, it's all subject to assumptions about how much is recoverable, prices, etc. I would not foresee that kind that of an economic boom in North Carolina.

Senator Wade: I also noticed that in North Dakota they had a $1.7 billion surplus that they have on hand and I also took a look at Pennsylvania and their average salary for an employee was $60,000. So you do think the difference in that is because of natural gas, oil, what would you say causes the difference in salary?

Dr. Walden: Again, subject to people's beliefs on what the best estimate is of recoverable supply, the on-shore supply of primarily natural gas in Pennsylvania is much, much larger, as I understand it, than what is thought to be in North Carolina. So again I would not, if those comparisons are true and I'm not a geologist so I simply take what is available, but if those comparisons are true then again I would not expect the kind of economic impact in North Carolina and particularly on-shore North Carolina.

Senator Rabin: Thank you for the presentation, Sir. In your "what I did" here, most of what we're talking about on that chart at least comes from the Pennsylvania experience. Senator Wade talked about Montana, a lot of us have seen Arkansas, which tends to be a very different case than what's going on in Pennsylvania. Is there any reason why you selected Pennsylvania and/or could you carry this into say, let's emphasize what happened in Montana or Arkansas with regards to the same issues and see if you come out with the same kinds of numbers?

Dr. Walden: I'll have to check the studies; I think one of them may be from Arkansas, but I can't assure you of that and that is a valid point, certainly a valid point. These numbers are not meant to be taken as "the truth", they are meant to show that at least for the studies that have generated and then that I added, there does appear to be some evidence, current evidence, of these kinds of impacts. Now that evidence may change over time, as the technology changes, but this is simply to alert you that at least there are some studies out there, well done studies, that have found this.

Senator Rabin: But it is valid to say that if you did the same kind of an analysis with most of it coming from Montana or most of it coming from Arkansas, the results would be different.

Dr. Walden: I would phrase it that the results certainly could be different.

Representative Catlin: Thank you for the presentation, this might be an early question, but I would assume that most of the reserves off-shore would be in the northern part of our coastline. Is there any control we would have of that, because of the lack of infrastructure that we've got in the northern part? We don't really have ports and pipelines and highways, is there a chance that this

would actually be shipped to Norfolk or do we have any control over that? Was that involved in any of your economic evaluation?

Dr. Walden: That was not, so I'm going to have to beg off on that. But I think your point though is well taken. If you look at our port facilities versus Norfolk, clearly the availability at Norfolk is greater. I will add though that since you mentioned port facilities, there is a big dynamic going on here as you probably know with the expanded Panama Canal and that presumably brings enhanced traffic to major east coast ports and there have been some economists who have said that while North Carolina may not be getting the big max tankers, we just can't handle them, we may actually get additional activity due to smaller freight being pushed out of those big ports. So how the development of off-shore energy and the need for ports might play into all that is I think is a good question and I one I don't have any good answers to.

Senator Newton: Dr. Walden, if I didn't say thank you for your presentation before, I meant to and I apologize. So my question goes to the on-shore job estimates, on your slide you had bookended them somewhere in between 132 and just under 8,000 jobs. My first question is was that based upon the USGS of about 1.7 tcf of gas, whatever it was.

Dr. Walden: Whatever it was, I tried to emphasize that all these numbers are sensitive to the quantity that is there.

Senator Newton: So the USGS has now re-estimated the Marcellus Shale from 1.7 tcf to somewhere between 100 and 200 tcf. The industry estimates it to be upwards of 400 tcf. So obviously 400 times, according to industry estimates, than what the original USGS estimate was. So my question is, if it turns out that North Carolina has a significantly more amount of gas than what the USGS estimate is, even if it is just twice or three times as much, would it be fair to multiply your job estimate by that amount or would that be an inaccurate estimation.

Dr. Walden: I think that would be fair.

Senator Newton: Just to be clear, for the audience and those that might listen, if it turned out that North Carolina had 15 trillion cubic feet as opposed to 1.7 trillion, than we might be able to estimate 10 or 12 times as much as the 8,000 jobs.

Dr. Walden: It would be more, yes.

Senator McLaurin: Thank you Dr. Walden, my question relates to the importance of us doing this on a regional basis. I know in the Gulf Coast we've got a number of states who worked together for many, many years on exploration, refining, production, drilling, could you share with us just what conversations have been going on within the states up and down the east coast to work together on something like this? Are you aware of those conversations?

Dr. Walden: That's not something I've looked into.

Senator McLaurin: I just think that would be something that would be very important for us and if this is going to happen, it is not going to be a go it alone process, especially for the off-shore and I should have clarified that when I asked my question because we've been going back and forth between on-shore and off-shore and I know there are some Governors involved in some type of a task force on a regional level. I just think that would be very helpful to us to have some data and some input from this region of the country.

Senator Rucho: Senator McLaurin, at one of the subsequent meeting we can have someone from the Governor's office give a briefing and as a matter of fact on down the agenda maybe we can ask that question because apparently he is the chairman of one of those multi-state efforts in trying to work with the federal government. I think when the energy advisor comes here a little further down the agenda you may want to ask him. Other questions? Senator Newton did bring forward that issue about 1.7 going to 400 trillion, there is a possibility and this is great, that is what we saw in the Marcellus, but let's talk about a diversification of our economy. Right now in essence, we have no energy, so if this is done, what other industries might we see develop; let's say for example we happen to have wet gas, which would be important in chemicals, pharmaceuticals,

and the like. Do you foresee and did you look at jobs that could come from the fact that we may have wet gas available on-shore and/or off-shore and whether industries might come from the fact that we have this in place and also the issue of the oil and gas service industry which doesn't exist now, both on and off-shore, coming out of one of the islands maybe or one of the ports in North Carolina, serving the entire Atlantic area?

Dr. Walden: Senator those are excellent questions and points. I think the short answer is that I did not include those numbers or an attempt to estimate those numbers. What I did do was include the typical, if I may use the term "supply-chain impacts." I did not look at what having a large and significant energy industry in North Carolina might do to attracting industries that aren't directly related to the energy industry. So, excellent point.

Overviews of Energy Programs at NC A&T, NCSU, and UNC-C

Senator Rucho then introduced Raymond C. Tesiero, Mechanical Engineer & Research Coordinator with North Carolina A&T' s Center for Energy Research and Technology (CERT). Following Mr. Tesiero's overview (*5a – Tesiero – Low Cost Strategies to Save Energy in K-12, 5a – Tesiero – NCA&T CERT*), Senator Rucho opened the floor to questions at 2:11 PM.

QUESTION AND ANSWER

Senator Brock: Thank you for your presentation. Can you tell us about the two schools in Wilkes County, what was the main difference between those two identical schools?

Mr. Tesiero: What I find when I'm doing these studies is a lot of time it's just human error. When the two buildings were built, they were built at the same time in 2007, so you had two different electrical contractors. When I went in and started gathering data, I noticed that all it was is a scheduling problem. They had their HVAC and loading systems scheduled beyond 12 hours a day, 7 days a week at one school, and at the other school they had it set up to be I think 10 hours a day, Monday through Friday, on Saturday, off 4 hours on Sunday. Something like that. So when you can come in and see actually what typically you have, which is very unfortunate is, you might have an electrical contractor that didn't get communicated to on how to set up the system. He's just told that day, "Hey, you're setting up this programmable thermostat" or whatever and he just does it and at the other school, they did it their way. Actually neither of them made any sense, when I went in, I talked to the principals of each school, made sure that we could incorporate the school schedule. So not only did we save the $50,000, I saved an additional $30,000 I think for each school, because we put school breaks in, we put the summer breaks in, those sort of things into the schedule.

Senator Brock: So you're looking at a savings of $80,000 over what length of time?

Mr. Tesiero: Annually.

Senator Brock: $80,000 a year for one school?

Mr. Tesiero: Two schools, and also this is a free service. You know, if you hired a professional engineering company to come in there and do that, it would have probably cost you. The Center is doing a lot of this outreach for free, but we're also doing it not only to assist the community, but we're doing it also to assist our students and our professional development within our Center, because we can publish off of it. It is a win-win for everyone, really. Use the Center, use the Universities that have this knowledge.

Senator Brock: Quick follow up, just the cost of maintaining and how we should maintain our buildings, especially on the education side, but also how professionals could come in and run the program a lot better than people are running it now. Thank you for your work.

Representative Stone: Thank you for the presentation, we're talking a lot about energy down in Lee County, so when you do those workshops maybe you can do one on a field trip and go down to Lee County and save us some money. We've got several schools who would love to have that

presentation, you could talk to them at all levels, and if you can't come to Lee County, consider making an offer to us to bus our kids up to your facility to see this presentation.

Mr. Tesiero: We try to, within reason, for people to make the commute to A & T and I think a lot of the other centers that are going to come up here and talk, they probably do a lot of similar things, so they are handling these types of things regionally.

Senator Wade: Thank you for your presentation and since I represent Guilford County, I just wanted to know are we working with the Guilford County Schools now and going in?

Mr. Tesiero: Oh yeah, your energy manager is Carol Green; she is a graduate of A & T. I've worked with her, I know her well and we've done a lot of work with Guilford County Schools.

Senator Wade: Do you have a rough estimate of what we might have saved in the Guilford County School system?

Mr. Tesiero: I get information from her, it depends on what schools are participating in our programs, but we have information. Now obviously when I say this, there are going to be a lot of things that can change the figures, with the schools that participate with these programs, she seen a 1% to 40% savings in each school on a month-to-month comparison from year to year. When I said that other things could affect that, obviously average temperatures in that month could vary and change those things, but it is still significant to show that the schools that do participate and the schools that don't, there is a considerable savings.

Senator Rucho then introduced Louis Martin-Vega, Dean of the College of Engineering at North Carolina State University. Following Dean Martin-Vega's presentation (*5b – Martin-Vega – NCSU Programs)*, the floor was opened to questions at 2:29 PM.

QUESTION AND ANSWER

Senator Rabin: Thank you for the very detailed briefing, I was just wondering as sort of a contingency idea, just in case it happened, are there inclusions in there to get into the shale gas engineering world and understand it, so that students are ready when they come out to take the jobs if they come to fruition.

Dean Martin-Vega: That is a really good question Senator, because in reality, a lot of the foundations associated with programs in civil engineering, especially in the geotechnical areas, for example in geothermal along with mechanical engineering and electrical engineering, are the underpinning for that kind of work. What really starts happening here is that you have students coming through those different areas that in fact become part of these efforts. Often times, what eventually develops is some level of Master's Degree program, if you want to add to that or professional program, but not that you start creating separate departments along those lines. Yeah, absolutely, I think what becomes a catalyst for that is when you have efforts that come together, things that really focus on these areas and then you start bringing people together to address those particular problems and issues.

Senator Rabin: More of a comment, when we visited Arkansas, I was very impressed with their operation center where Masters and higher level personnel were there actually operating, sort of distant from but as part of that team, and having folks prepared to do that, if we need it, would be a good idea.

Dean Martin-Vega: Absolutely and this is what really has emanated. It wasn't like overnight, there was this capability say in things like smart grids and so on, what happened is that it starts becoming a catalyst, in the case of the nuclear area which is very mature, it isn't just the nuclear engineering department. It's mechanical engineers that minor in nuclear, it's the civil engineers and so on and they build that expertise. For example, in Wilmington, they probably bring onto their facility as many or more people with mechanical engineering backgrounds as they do with nuclear engineering backgrounds, but again across that common core. But you are absolutely right, this is exactly what starts happening when needs like these are identified and especially the industry side of this is really important. These companies that are involved and these

organizations that I shared with you are not just spectators on the side, they are involved in driving the research in certain directions, they have a lot to do with starting to have input in some of the research, the educational programs. So it really moves things in a way that makes sense for everyone that is in this. Some of them become quite generous, in terms of helping supporting new faculty positions, but your point is very important. There is a base background that is really a common denominator for all of these efforts, so we strive to make sure that you never lose that, that's there. If you talk to these companies, especially the ones that are much more technical and engineering oriented, they will tell you to make sure that the depth is there in some of the fundamental areas and then go from there to understand the occupation. I think with the kind of critical mass that we have, there is a lot of potential here to have people get involved in that. Internships, I would say that over one third of our students are working with industry, often as soon between their first and second year and so whether they are in mechanical engineering or in civil or in electrical, being involved with organizations that are working in these directions with these kind of needs, early on they start becoming a part of that industry. That is basically the kind of dynamic that I think evolves.

Representative Hager: Thank you for coming today and it sounds like this is your passion; I think there are two engineers here. I'm mechanical and I think Representative Catlin is civil. I think in today's world we've done such a good job, energy is almost a no-brainer. You flip the switch, you expect it to come on and only when it doesn't come on do you start to worry. Recent meeting with the Board of Governors, they have made part of their goals to drive more research into STEM type activities, which we know drives heavy manufacturing, drives the industries towards Charlotte and toward the Research Triangle Park. Are you, in looking forward on the renewable side, are you looking at new research in battery technology that seems to be the Achilles' heel in renewables right now and, as you answer that, are you guys working on the nuclear side in an of the small, modular reactor issues?

Dean Martin-Vega: On the first count, you are absolutely right. The battery issue has always been the Achilles' heel; in fact I didn't want to put too many slides up here. There is another large center we have that is working on wearable health monitoring devices that would not need batteries to power them. So the underlying technology there really has to do with replacement of battery in some way or doing things in some ways, obviously you can do the storage capability because the issue with renewables too is the lack of consistency. So how does one make sure with wind and so on and so forth? Between those centers and those activities, that is a key issue. This solar cell efficiency issue, the ability to be able to capture energy and store it in ways that we haven't been able to do it before, without literally the physical weight and size that we are talking about with battery capabilities. That is a major choke point, if you will. So that is a big, big focus of a lot of this stuff. What was the second one?

Representative Hager: In your research you've done on more of the small modular…

Dean Martin-Vega: Yes, yes, absolutely. That is a big part of this. When I talk about the next generation of nuclear reactors, they are really looking in those terms and so that has been a very unique opportunity, in fact quite honestly you talk about having to make decisions. I've been now at NC State going on 8 years, but when I arrived at NC State the program in nuclear and nuclear energy had really gone down significantly. This was a nationwide thing as well. There was a decision that had to be made as to whether it would be merged with another department or would we try to support it even more and we kind of it went in the direction of making it stronger and the net result of that was that we've been able now to develop capabilities to do research and studies along those lines. That is a very, very big part of that. We are actually, it is very intriguing to see how that is developing at this point, we certainly invite you at any time and any of you here on the committee and all of you that are here to just come over and take a much closer look. There are just tremendous amounts of details behind this, but I certainly didn't want to put all of that up here today.

Senator Rucho then introduced Dr. Johan Enslin, Director of UNC Charlotte's Energy Production & Infrastructure Center (EPIC). Following Dr. Enslin's overview (*5c – Enslin – UNC-C EPIC)*, the floor was opened to questions at 2:54 PM.

QUESTION AND ANSWER

Representative Hager: Just wanted to know if you have any advice about what we can do with 106 million tons of coal ash?

Dr. Enslin: Well I think if you'll remember Representative you were in our program, it's probably not going to make up all your coal ash problems go away. But I think there are great technologies where you can look at now at minimizing the leaching efforts, going into the ponds. I think there is a wealth of technology available; the funding opportunities really make those into scale productions and applications.

Senator Rabin: Thank you. I was just wondering on this last chart with the school would it be possible to take that concept and say if you had soldier or sailors or Marines, service people exiting the service, coming in and beginning an energy career, using that facility, is that a possibility?

Dr. Enslin: Well that is a regular high school, early-college high school. But on the other hand, that is what I call the lifelong learning opportunity to take a mid-level person, a veteran, and bring them into our program. There are some opportunities, I think we can streamline those a little bit better, but there are some opportunities to work with our community college, get that sort of early engagement for the veterans. But absolutely, I think we need those sorts of resources back into our professional strength. I'm not sure the school itself will be the right place for it, but absolutely.

Senator Rabin: I'd like to follow up on that with you, kind of offline for something else I'm doing. Thank you.

Mining and Energy Commission

Senator Rucho introduced James Womack, Chairman of the Mining and Energy Commission (MEC). Chairman Womack gave reports on: (i) activity of the Mining and Energy Commission (MEC) concerning the rule development process for the management of oil and gas exploration and development activities in the State, and use of fracking for that purpose; and (ii) report on the study required by Section 2(b) of S.L. 2013-365 concerning the appropriate rate of severance tax that should be imposed in association with oil and gas exploration and development activities using horizontal drilling and hydraulic fracturing treatments in the State. Chairman Womack also gave reports on legislative changes requested or recommended by MEC in association with development of modern regulatory program for the management of oil and gas exploration and development activities in the State, and the use of fracking for that purpose, as required by Section 2(m) of S.L. 2012-143. Following Chairman Womack's reports (*6 – Womack – MEC Activity Update, 6 – Womack – MEC Schedule and Timeline*), the floor was opened to questions at 3:14 PM.

QUESTION AND ANSWER

Senator Wade: Thank you Mr. Womack for that presentation. I have several questions. The North Carolina Environmental Partnership allowed me to be a star of one of their recent ads.

Chairman Womack: Congratulations.

Senator Wade: Thank you. Although I wasn't consulted on the content or the development of the ad, I just want to be sure since I'm the star that there's not any misleading public information in that. So I'd like to start with the indication that fracking has been fast tracked. To me it looks like from when you originally had your Commission set up until you think they'll be any is about 3 years, is that correct?

Chairman Womack: Approximately correct, yeah. Actually if you look at the DENR study, you go back to 2011 when it was kicking off. So you're looking at 2011-2015, actually about 4 years from the time the DENR study was started until the time that we are going to start, so about 4 years. We actually knew that there was oil and gas in the Triassic Basin dating back to the 1970s, so I don't know if that's "fast", that is 40 some years, I wouldn't call that fast.

Senator Wade: To me it would look like were about 7 to 10 years behind Pennsylvania, North Dakota, everybody else. The other questions I had was on air pollution, my understanding is that we won't get any permits till after 2015 and did the EPA not say that 95% of whatever pollutant they think is in the air has to be taken care of?

Chairman Womack: There are developmental rules that the EPA is working on in air quality and it's almost like a kabuki dance, that thing keeps changing all the time. I know the Division of Air Quality is monitoring that very closely. We actually, the Mining and Energy Commission itself does not have a lot of authority in that area, that is monitored by DENR Air Quality, there are non-point-source and point-source air quality standards, we are being very careful to monitor and comply with that everything that the EPA does, but that is really kind of prescripted, we don't have much latitude in that area to rule that.

Senator Wade: My understanding is that it completely eliminates flaring after 2015 and that 95% plus of all air emissions have to be captured at that point.

Chairman Womack: That was in the draft rule that I read, but I'm not sure if that is the final rule, I would have to verify that.

Senator Wade: OK, next question I have is that this also mentions that they are going to use benzene, silica, and formaldehyde. Now benzene I'm a little familiar with because back in my chemistry days I happened to pipette it in my mouth, I will admit that my professor got a little worried and hosed my mouth out, but it didn't kill me or anything. Formaldehyde of course I work with everyday being a veterinarian, but will you know exactly how much of that will be put in the formula and it seems that you are being extra careful with making sure that it doesn't get into the water.

Chairman Womack: Yes, ma'am. The well stimulation fluids that are going to be used to put down the vertical well bore are incased all the way down into the ground and that is an industry decision about what chemicals they use, except for the banned list of chemicals and I believe silica is on that list, we have a banned list of chemicals that are prescribed by the EPA and they are on our banned list and I think benzene is on that list. If it is on the banned list it can't go down there at all, in any quantity. Second part to your question is we should know, DENR authorities will know everything that is going down that hole. Now, the quantities by mass and volume, they will be briefed on, but they wouldn't necessarily be retaining a record on it, but the industry will be required to retain that record and it will be subject to recall. In any case where there has been a compromise of a well bore or there has been a spill or an accident, they will be required to relay all of that to emergency services personnel instantly. So there are mechanisms in place to recover it instantaneously, there are mechanisms for the DENR Secretary to get his hands on it at any time, and they will be briefed on it in advance of the actually well stimulation.

Senator Wade: My final follow-up, certainly there is an indication on this particular ad that says that I and some of my colleagues will be putting families at risk. Mr. Womack, I think after hearing what you're developing in these rules, I would think that you are doing everything in developing these rules to make sure that no one is put at risk.

Chairman Womack: Senator Wade, I totally agree with you and I would add to that, you know Representative Stone, Senator Rabin, and myself live in the Triassic Basin. We live there. That is my backyard and I'm not going to do anything that is going to put my kids at risk. I've got to live there and those are my friends and my family that lives down there too, I'm not going to do that. I'm not going to do anything, and I'm an engineer by trade, I understand this business, I understand enough about it. I have studied it, I've researched it. I'm not going to do anything that's going to put my friends and my family at risk, or anyone else's. So I give you that assurance, there is a lot of hype and alarmism that is flying around out there, but the truth is that we are going to what's sound and what's good science and good engineering.

Senator Wade: I just want to thank you Mr. Womack and your Commission for all the hard work you are doing and I certainly know that there isn't anyone in this room that wants to put anyone at risk. I appreciate all your hard work.

Representative Stone: Thank you Mr. Womack for giving a great presentation as usual. I'd like to also take an opportunity to tell you that we really appreciate, I know it always gets out in the news media through a variety of sources that demonize the work the Mining and Energy Commission is doing and it is a great bi-partisan group. It's very fortunate to see that we have been able to obtain such good rules so far in the rule making process. I also want to remind folks that as you go to these meetings, we do have a lot of public input at these meeting to help move them forward in a judicious way. Mr. Womack himself, I want to say I think this rule making process has about consumed you over the last year or so, so I really thank you for your hard work and all you've put into it personally. I do want to follow up with a question because you are limited by your actions depending on what the General Assembly sent your way. With all your expertise and looking inside the natural gas exploration, what would you say or could you list as opportunities that we may not be currently looking at. If you had sort of free-range to may probe a little deeper in some areas, what would it be just general, just wondering if there was anything we could do better than we are currently doing or that you are limited by.

Chairman Womack: Well there are a lot of things that in retrospect we wish we had done maybe a little earlier or sooner. I mean, I've got to tell you, this State has been very forward thinking. I'm constantly amazed at the vision that this Commission itself has had and that the Legislature has had. I looked back at Senate Bill 820 and I'm just amazed that it passed the first time around. I give you guy's great credit for the thoughtfulness that went into Senate Bill 820 and then Senate Bill 76 last year, the great bill that really put a great framework in place, with a few tweaks it's going to do a great job for us. I would tell you that there's two things that are really troubling to me right now and these are not things that are in my sandbox, so it's not anything I can do anything about. Number one is in the industry there is an upstream, a midstream, and there is a downstream. We've got a pretty mature downstream in this State; Piedmont Natural Gas and PSNC have got a good handle on downstream. When you get the oil and gas companies interested, when we start moving towards permitting, the upstream will take care of itself. It's the midstream that is an issue. The midstream is always what holds everybody up and it's holding up the Bakken right now, as oil rich as the Bakken is, it is like an OPEC country up there, and it's hold up. They have shut-in wells with oil and gas ready to go to market; they are having to put railroad cars up there and dumping oil in the railroad cars to move it to market. They have these train accidents because they can't move it by pipe. So midstream is always what holds you up, it's what slows down the process, it's what slows down the drilling, it's what keeps you from realizing your full economic potential and anything you can do to figure out how to accelerate the midstream development, that is gathering lines, compressor stations, separators, fractionators, anything you can do. Research Triangle Energy Consortium and other folks, I know the Lieutenant Governor's Energy Policy Council, other folks are looking at this. I know Dr. Warren is looking at it, but anything you can do to emphasize and accelerate the development of midstream is what it's going to take to get North Carolina in the energy business. That one thing will probably make the biggest difference. I want to see the state get in the business as well, but you know that is what it's going to take.

Representative Stone: Going back to the process that we outlined. Safety hazards, do you foresee anything that in your opinion that could be done different to make sure that we protect our land, air, and water even better than we've got in current legislation?

Chairman Womack: Well you've given us a charter to do it safely, so all the rules are written around what we think are optimal safety standards. We are going to emphasize the emergency services personnel at the county level to have the ability to respond to most of the range of threats that have to do with this. There are some things that are just beyond their ability to control. Well blowouts are just not things you're going to be able to train and handle at the local level. That is why we'll have industry maintain that relationship to do it. But local authorities will have to have the ability to reach out and go get somebody in case industry for whatever reason is irresponsible. That is the one area that I could think of. There is one other thing that is coming up, there is an initiative in the Triangle region to put an emergency services training facility and I think it would be good for this Commission and for the powers that be in the Triangle region to put their heads together and try to put together the resources together so that emergency services center is in a good spot. The old airstrip at Lee County is a really good place to do it, that's where a lot of them are training now. We could build that up and it could actually be a good place, not only for oil and gas emergency training, but other training as well.

Senator Brock: You kind of answered or lead into a couple of my suggestions or questions. One of the main issues we have as far as the delivery of service and also with the safety response, we looked at that while we were in Arkansas. Their little community college and how successful it was and how it relayed into other industries for its citizens. One thing it kind of grabbed me a while ago, looking at the set facts and looking at the slides that talked about the health, I know in Arkansas we talked about it, but also looking at the – in fact they used their color scheme of their stuff to kind of blend into the environment. I just want to make sure that we don't get too carried away with it that we have to have it looking like a bush or a tree; I hate to say more in the design of Cary or ordinance. We don't want to get too carried with it, but I thought they did a pretty good job as far as trying to make it look like it look as much like part of the environment as possible.

Senator Rucho: Mr. Chairman, question for you. In your process where you list of all of your agenda items that you are trying to get accomplished and you pass them through and they are on their way to rules, is the DHHS actually studying those now so that if they have any comments or any thoughts about this? Are they looking at that as they Rules Review Commission is working on it?

Chairman Womack: You said DHHS?

Senator Rucho: I mean DENR, excuse me.

Chairman Womack: Oh DENR staff is supporting us every step of the way. In fact, we have weekly interchanges with DENR. So I don't think we will be out of step at all with DENR. I can't imagine that we would be.

Senator Rucho: So they have been following your rules as you're proceeding through and as you get your majority or actually unanimous votes on most of them. That is they will be up to date on that part.

Chairman Womack: Yes sir, I dare say they write the rules, their staff is writing our rules at our direction.

Senator Rucho: OK, another question. You talked about changing rules and it's an ongoing process as new technology happens, you are going to be making those changes or what you may learn from some other areas. Is that correct?

Chairman Womack: That is correct.

Senator Rucho: I guess my last question is going on the safety issue, when you were given the charge to come up with the most state-of-the-art rules and regulations dealing with shale gas exploration and development, in addition to trying to avoid any of the pitfalls that other states have experienced in 60 years, you have taken those steps but also I am assuming that you have a contingency plan to handle any of those problems as they may appear.

Chairman Womack: Well we think we do. There is always the unforeseen, but we try to think through. We have two very accomplished engineers that are on our team that anticipate the kinds of things that can happen and we war-game those. So I think we have taken a reasonable look at worst case scenarios and what can happen and how we would respond to that.

Department of Environment and Natural Resources (DENR)

Senator Rucho introduced Donald R. van der Vaart, Ph.D., J.D., P.E., Energy Policy Director of DENR. Dr. van der Vaart gave reports on legislative changes requested or recommended by the Department of Environment and Natural Resources (DENR) in association with development of a modern regulatory program for the management of oil and gas exploration and development activities in the State, and use of fracking for that purpose, as required by Section 2(m) of S.L. 2012-143. Following Dr. van der Vaart's report, the floor was opened to questions at 3:33 PM.

QUESTION AND ANSWER

Senator McLaurin: Thank you, sir, for your presentation. My question is really related to the region of the country that we are in and if we are in discussion or collaboration with other states because I think that it is very likely that North Carolina is not going to be moving forward on some of this activity on our own and just to have some feedback on what other states are doing and how we are coordinating are work with theirs.

Dr. van der Vaart: Well I think Chairman Womack made it very clear that they are looking at, from a regulatory standpoint they are looking very closely at other states. As far as areas tend where we tend to see regional collaboration, it's typically when the dederal government has in some way limited or constrained the activity. So obviously as Chairman Rucho pointed out, the Governor is the Chairman of the Outer Continental Shelf Governor's Coalition, which has to do with bringing state interests in front of the federal government in the particular area of off-shore development, gas exploration and wind resource exploration. The reason of course is because in that scenario, the federal government controls that resource entirely, so there is an instance where we want to be able to group together to bring interests to the federal government. Certainly in this context there will be some of that in terms of transport in and out of North Carolina, but I think when you approach it just on the development of gas resources on-shore, I think that the work that Chairman Womack is doing in coordinating the approaches of other states is probably all we need, at least for a good start.

Senator McLaurin: I'll maybe take that step further, the impact on local governments. I'm hearing some real concerns in my district. Small, rural communities just do not feel that they have the man power, the expertise to be able to really analyze and be prepared for this whole process. So I'm asking if you have made efforts to reach out into these communities that are part of this basin and have conversations with local emergency management and other officials to just get a handle on their concerns so that they can be addressed. There is a lot of information just floating around and I think that would be a very proactive and positive step to take. If you could comment on that.

Dr. van der Vaart: I can say that is a great suggestion and that we will follow up to see if it is something we can do on the front end, clearly the idea of the severance tax and the distribution is intended to address that once the production is going. But I understand their concerns and I will get back with staff and see if we can't reach out.

Senator Rabin: Thanks for the input from DENR. It seems to me that the three categories you mentioned are looking at safeguards, but there doesn't seem to be much concern at DENR, from what you said, with regards to any impending disaster coming from all of this, as long we have the good rules and regulations in place. Is that a fair statement?

Dr. van der Vaart: My comments were made to superimpose on the good work that the MEC is already doing, these are legislative questions that we would like you all to consider.

Senator Rabin: Thank you.

Department of Transportation (DOT)

Senator Rucho introduced Jon Nance, Deputy Chief Engineer for the Department of Transportation who gave a presentation on changes needed for energy-related road use. Following Mr. Nance's presentation (*8 – Nance – DOT Perspective on Energy Recovery*), the floor was opened for questions at 3:50 PM.

QUESTION AND ANSWER

Representative Stone: Thank you; I basically have a statement here on the great presentation today. I just want you to know that I enjoyed traveling through Arkansas and Pennsylvania and we talked a lot of infrastructure and roads and the impact it's going to have in our community. It gives you an opportunity to look back and realize that North Carolina is far ahead of some of our competing rivals, especially in the development of our secondary roads. I can remember traveling miles down dirt roads and meeting school buses. Lee County is going to be, most likely, the epicenter of this natural gas exploration and I can tell you we are light years ahead of some of the

places I was at. So the impact on the roads and the wear and tear and the additional traffic, I was there during all times of the process in these other states. I think sometimes some of it is overhyped a little bit, I didn't see some of the things I was told I was going to see and I was looking, because I knew that I was trying to figure out how it was going to affect Lee County and the people and the city of Sanford and it just never arrived at that point to see it. So I'll go back again, we've got great infrastructures throughout North Carolina, Lee County in particular is light years ahead of the places I traveled that were looking for natural gas. Our secondary roads are in great shape. Will they have wear and tear? Of course and I'm sure we can facilitate that, I just want to make sure that as we look at the wells that we are drilling, the fees and the money go back to those communities, not some other project on the other side of the state.

Representative Hager: Just in looking at roads in North Carolina and how we look at road use agreement, do you presently have the statutory authority to perform road use agreements or do you need that?

Mr. Nance: We do have the authority to do that, our approach right now is more of the Pennsylvania approach where we don't have a lot of this, for instance if someone wanted to go build something in an area and loaded a truck and there were issues with the carrying capabilities, we would require a bond of them if there was not agreement to do that upfront, then we would post the load carrying capacity. So it's very specific to the requests and it's generally a short term arrangements, whether it's construction in a subdivision or a commercial area. We have a process but it's not currently set up to look at major operations that these would be.

Representative Hager: Do you need that statutory authority?

Mr. Nance: We do that the statutory authority to do so.

There being no further business, the meeting adjourned at 3:54 PM. The next meeting will be held on May 8th at 1:00 PM.

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Senator Bob Rucho
Presiding

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Will Verbiest
Committee Clerk