STATE OF NEW JERSEY

DEPARTMENT OF ENVIRONMENTAL PROTECTION

IN RE: :

CLEAN AIR COUNCIL :

PUBLIC HEARING :

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Certified Shorthand Reporters & Videographers
425 Eagle Rock Avenue - Suite 201

Roseland, New Jersey 07068
(973) 228 - 9100
www.rosenbergandassociates.com

COUNCIL MEMBERS:

James Blando, Chairman
Ferdows Ali
Jorge Berkowitz
Joseph Constance
Michael Egenton
Elease Evans
John Elston
Manuel Fuentes-Cotto
Toby Hanna
Richard Lynch
John Maxwell
Pam Mount
Joyce Paul
Joseph Spatola
Kenneth Thoman
Junfeng (Jim) Zhang
Irwin Zonis

A G E N D A

A G E N D A

CHAIRMAN BLANDO: Okay.

I think we should probably get started.

I would like to welcome everybody here today to the New Jersey Clean Air Council Annual Public Hearing, "Improving Air Quality through Energy Efficiency and Conservation - The Power of Government Policy and an Educated Public."

As many of you may or may not know, the Clean Air Council was created in 1968. We serve as an advisory committee to the New Jersey Department of Environmental Protection Commissioner.

We also do provide our annual report to other agencies, as well, when the issue is a cross-agency issue, such as the one today.

Today's topic is a very important one, as many of you know, especially since New Jersey is currently embarking on the

New Jersey Energy Master Plan, which is a very big initiative within state government.

Energy needs are projected to increase dramatically, globally as well as in the State of New Jersey so this is a very important topic.

I would like to thank all the council members for being here today. I would like to thank the New Jersey Department of Environmental Protection for their support of the Clean Air Council. I would like to thank the Commissioner, as well.

I would like to start by having all the Clean Air Council members introduce themselves and state who they represent on the Clean Air Council.

Jim, why don't you start.

MR. ZHANG: My name is Jim Zhang. I am a professor at the school of Public Health at UMDNJ at Rutgers in New Brunswick.

MR. SPATOLA: My name is Joseph Spatola and I represent the public.

MR. EGENTON: Michael Egenton. I'm the vice president of Environment Transportation for the New Jersey State

Chamber of Commerce.

MR. CONSTANCE: Good morning, Joe Constance, small business ombudsman, New Jersey Commerce Commission.

MR. BERKOWITZ: Good morning, Jorge Berkowitz. I am with Langan Engineering providing all services and I represent New Jersey Business and Industry Association.

MR. HANNA: Good morning, Toby Hanna. I work for Environmental Resources Management. I represent the New Jersey Society of Professional Engineers.

MR. LYNCH: Richard Lynch, Environmental Safety Management Corporation. And I'm representing the American Industrial Hygiene Association.

MR. ZONIS: Irwin Zonis. I'm retired. And I represent the public.

MR. ELSTON: Good morning, I'm John Elston. I am also retired and I represent the public.

MR. ALI: My name is the Ferdows Ali. I represent the Department of Agriculture and agriculture industry within our council.

MS. EVANS: I am Elease Evans, Passaic County Freeholder Director, Passaic County Board of Chosen Freeholders. I represent the New Jersey Association of

Counties.

MR. THOMAN: My name is Ken Thoman. I represent the New Jersey State AFL/CIO.

MR. MAXWELL: Good morning, I'm John Maxwell. I am a member of the public honored to be on the Council. In my spare time, I work for the American Petroleum Institute doing the Lord's work.

MR. FUENTES-COTTO: Good morning. I'm Manuel Fuentes-Cotto representing the public.

MS. PAUL: I am Joyce Paul representing the State Department of Community Affairs.

CHAIRMAN BLANDO: Thank you very much.

Just a few housekeeping items.

Many of you probably realize the bathrooms are right outside the doors there.

Generally speaking, the annual

public hearing takes questions from the Council. If anyone in the audience has questions, you can jot them down and give them to Sonia Evans, who is in the back room, I think, or you can, of course, e-mail the Clean Air Council through the Clean Air Council website.

If you want additional information of the Clean Air Council, please feel free to go to the website, which is on the DEP's main page.

So without further delay, let me introduce the Commissioner of the New Jersey Department of Environmental Protection, Lisa Jackson.

And without further delay, Lisa.

COMMISSIONER JACKSON: Thank you.

Good morning, Council Members, thank you for inviting me.

Thank you, James, for not only inviting me, but chairing the council.

Thank you, speakers. I was going to read the list of speakers, but they're too long so thank you speakers for taking the time today to address us and the public and the

Council on a very important topic.

This council has a wonderful history or legacy or vision of picking topics that are extraordinarily timely that impact public health in dramatic and important ways and that has the potential to impact public policy decision making right at the right time when decisions are being discussed and made.

Based on your agenda today, you have within this room and as speakers and thankfully on our own Clean Air Council, people who will be very influential and who need to hear what the speakers have to say in order to make some very important decisions in the near future about energy and policy in our state.

I guess -- I do what Bill O'Sullivan tells me. He said, Look, build on the power of government policy and an educated public; that's what we're here for today.

The reason I always commend this council is that the first time I came to a council meeting as an assistant commissioner, I was struck by the format and the fact that this council would pick a topic every year to opine about and they would pick wonderful ones.

We're trying to export that throughout all the councils that we have at

DEP because we have a number of them, most of them make exactly the same salary you all do, I am sorry to say, but serve in various capacities to, as I call it, be part of my cabinet, if I could have one.

So this council, the Clean Water Council, our Environmental Justice Advisory Council, and we have several others, I just picked a few, are very important in terms of me understanding and me having a place where we can allow other people to provide input to the Department.

I want to take a moment to acknowledge our very special, wonderful partnership with the BPU. This is really as much or probably more their topic than it is DEP's. Where we fit in at the DEP is I think the very clear overlap between energy policy and the environment, environmental threats of all kinds, not the least of which is greenhouse gas, which I am happy to talk with you about in a few minutes.

BPU, and you will hear from Mike in just a few minutes, works very closely with this department. It's funny, I go around the country and deal with other environmental commissioners. They talk about the challenges of getting their BPUs and their public utility commissions, the PUCs or whatever they call themselves to work on environmental issues.

We don't have that problem at all. We did it the right way. We infiltrated from the outside into BPU. As many of you know, Jeanne Fox is more than an alumni of this department, as is Mike, as is Lance Miller and Sam Wolfe. And I am sure there are other ones over there that I am leaving out.

We have an incredibly good working relationship. I think it serves the State well. It is serving the Energy Master Plan development extraordinarily well under Jeanne and Lance and Mike's leadership. We work together.

They have been already on the cutting edge of things like renewable portfolio standards for our state and a clean energy program that I know you already know is second to none in terms of its ability to incentivize with the stuff that counts, real investments in clean energy and renewables in our state.

Here at DEP, we don't want to let down our end of the bargain and so I think you have seen over the past, actually, just a few months, a real emphasis on things that count, including greenhouse gases.

We already have a great foundation to build upon here. I wish I could take credit for both of the really crucial parts of greenhouse gas for our state, but they were started under my predecessor with great vision, both the California low-emission vehicle program, which goes into effect in 2009 and the Regional Greenhouse Gas Initiative, which is a consortium of ten northeast states. Those regulations I think are effective in the beginning of 2010, approximately, 2010.

A couple of other things before I expand on those.

In the Governor's current proposed

budget for 2008, we have $4.5 million set aside. We actually put that money aside and asked the treasurer to help us put aside some penalty money and some supplemental environmental project money from Atlantic City Electric to help fund the next level of inquiry for off-shore wind.

Governor Codey had a blue ribbon panel on wind; that report came out last year. And one of the major reports was: Listen, the wind in New Jersey is off shore. And while we believe from a public policy perspective that we should invest off shore, we want to do it in a smart way, not where people come to the State and say, Hey, I would like to put up a wind farm, but to understand what the impacts are to our natural resources, what we might be doing to our ocean resources in investing in wind.

And so we, I think, have put an unprecedented amount of money, $4.5 million of public financing that we could be using for other environmental projects or to balance the budget towards an RFP that would be led in the next month or so for studies of our ocean environment, mammals and fish and others -- invertebrates and everything else you might want to know so that we can understand what our resources are and make an informed decision about siting of wind farms. And it has the ancillary advantage of telling us a lot that we don't know about our oceans.

I am very hopeful that that money will be leveraged, that we're not talking about 4.5 million in public dollars, that we're talking about maybe, 9, 10, 12 and 15 in public and private and grant money at our academic institutions so that we can see an even more significant investment in research and knowledge.

The greenhouse gas emissions inventory, I should say a few words on.

There are states across the country, progressive states who are now coming together to talk about inventory and greenhouse gases, New Jersey had a 1990 inventory, which is currently being refined for 2006. And I think that as we work with other states across the country, we will again be leaders in helping them to inventory and track emissions, so that we can know where we start and therefore know where we end in this thing called greenhouse gas reduction.

The Regional Greenhouse Gas

Initiative, as I mentioned is 10 states, if you count Maryland, which is in and required by law to be in, they signed the MOU to join by, I think, the end of June this year.

We're missing Pennsylvania. Many of you who live in Pennsylvania, write a letter to Pennsylvania and say, How could you not be a part of this thing called the regional greenhouse gas inventory. It would be nice to see them join.

I say to people all the time when I talk about it that I would like to pretend that this was the most dramatic attempt to cut greenhouse gases, but it's not. It's a relatively modest one, honestly; and that was by design. It's only the power sector. It is stabilizing emissions at current levels until I think it's 2014 and then a 10 percent reduction after that. So we're not talking about even levels that match the Governor's greenhouse gas order, which I'll talk about in a second.

The idea was to really implement and operationalize the cap and trade program for greenhouse gas emissions; that needs to be done.

Do we look for and hope for a national program that is aggressive; more aggressive?

Absolutely.

Is it necessary?

I think yes, ultimately, it is, absolutely; but I think what is happening across this country and what will continue to happen, unfortunately, it seems, as President Bush recently said, he's not looking for EPA to enter the regulation of CO2, as a pollutant in the world, so he'll be waiting awhile.

The states have not been waiting and I do not think they will wait. The western governors have already come together several of them and organized a group whose acronym I can't remember right now, but is basically coming together to implement the cap and trade program in the western states, including, California which all by itself is sort of a small country or a big country.

I don't think this country will wait. I do believe personally and professionally that we need a national standard, but we are also out there advocating very strongly that it should be a national standard that builds on state efforts, not undermines them and that builds on state knowledge and local knowledge because that's where the real work is happening with respect to permanently changing greenhouse gas.

Governor Corzine's greenhouse gas initiative was in Executive Order 54, which he issued in February of this very year. And it sets what some might call aspirational goals. It sets a goal for 2020 that we would roll back the clock so that by the time we get to 2020 our greenhouse gas emissions are back at 1990 levels; that's about a 16 to 20 percent reduction from business as usual projections; and then, an 80 percent reduction from current levels by 2050.

No, he won't be governor in 2050.

So why did he do it.

No, not so he could take a victory

lap. I really don't believe that that's the reason to do that.

The reason we advocated so strongly for him to set an aggressive 2050 goal is twofold.

No. 1, the science shows that to make a real difference in emissions and in the level of CO_2, you need some pretty drastic reductions in man-made carbon dioxide and other greenhouse gases by 2050, so we were looking at the science.

The second reason is that in order to see the kinds of changes we are going to need, you have to set an aggressive goal out into the future and allow businesses, and this is from the Governor's own mouth, a chance to adapt and understand the regulatory environment that they face and time to deal with it.

So he thought it was very important that we not pick something that was easily achievable so we would all feel better, but that we pick a science-based goal and put it out into the future and say to people, This is where this state intends to head, not just because we want to regulate you, but because we believe that we should be investing intellectual and real capital now in solutions as an economic driver towards real environmental protection.

The Greenhouse Gas Order, Executive Order 54 gives us about six months to develop a plan to meet the 2020 goals and start to address the 2050 goals.

We're working in conjunction with BPU and DOT and the EPA. The EPA is critically important when it comes to energy efficiency and building codes and standards and those issues.

Last week, many of you saw that the Supreme Court affirmed, I think, what we had hoped they would affirm, which is that EPA does have the ability to regulate CO2, as a pollutant under the Clean Air Act, which was very important. It preserved our right to do things like implement the California car legislation.

Again, I can't say enough about state leadership on this issue. I think if you talk to people, especially, as gas prices approach $3.25.

MR. MAXWELL: It depends where you are.

COMMISSIONER JACKSON: It depends

on how close you get to Memorial Day. I don't know. But as we do, you would hope and we do, that there would be an opportunity to make energy efficient both in the transportation sector, but also in the home building sector and also in the retrofit of existing home sector.

You would hope your lessons are getting easier to learn, but with strong leadership from the State, from setting goals and telling people that we really mean it, we will soon have greenhouse gas legislation in this State, that will change the Governor's Executive Order goals into the law of the land. And I don't think that anything is going to change to stop that.

All those things mean that we are pointing this state and this country into a direction of reducing greenhouse gases.

We are here today to talk about energy. I am happy to answer a couple of

questions and then we will hear from
Mike Winka who knows a lot more about it than
I do.

CHAIRMAN BLANDO: Do any council

members have questions?

Jorge.

MR. BERKOWITZ: In the private sector, we notice you can't go to meetings these days and talk about strategic planning in the private sector and not hear about green, being a green company, being green companies, green buildings.

One of the market reports we have said, One of the biggest demands for people coming out of schools will be people who are starting to talk about how you do sustainability and green designs and all that. And what we see is that maybe there is a lot of momentum starting to build in the private sector.

I was wondering, is it your perspective, as well, that there is lot of momentum building in the private sector towards sustainability, energy efficiency, green building; and is possible that the private sector might even out pace government?

COMMISSIONER JACKSON: Absolutely.

You know, many of you can answer that question better than I can.

Joanna, you could.

I think there are a couple of things working here. It's always funny for me to sit in a meeting. I had one not long ago with a major company and they were coming in for a penalty situation, actually, a permitting/penalty situation. And I said, Okay, well, why don't we talk about a supplemental environmental project. And their big pitch was they were going to do all these energy efficiency things. And I couldn't help but think, Well, wait a second, you're going to spend money to pay off -- I think the longest payoff was two years. So you're going to spend some money to make me happy so that your bottom line, your ability to be profitable goes up dramatically and you can say you did something for the environment.

So I don't understand why a progressive company with the ability to look ahead and try to develop a business plan, would not be trying to understand what the payoff is in terms of, at a minimum, energy efficiency.

Sustainability is clearly one step

beyond that. Sustainability for a lot of companies is all about recognizing that if the country is moving in that direction, you need to make sure your product line and your development is moving in the same way. I think there is a spectrum. I think there are clearly companies out there still fighting it. That's where regulations and laws take over, instead of voluntary programs; but yes, we absolutely are hearing more, even in permit meetings, from people who say, Well, what can we do to make this investment in green technology. Sometimes it's not enough. Sometimes we have to push.

CHAIRMAN BLANDO: John.

MR. ELSTON: Commissioner, I was curious -- and I'm very happy to hear the resource commitment of $4.5 million for energy studies. However, I was a little bit uncertain as to how extensive these studies might be.

Massachusetts, I guess, had had problems with some of the tourist industry off shore. And I was wondering whether, in fact, this would be -- how broad of a state effort, not just the EP effort, this study would be.

COMMISSIONER JACKSON: The $4.5 million is for the environmental aspect of the necessary study. And I know you are familiar with the Blue Wind Panel report. They didn't just look for environmental studies. They looked for commerce-based studies to look at tourism, also, effects on commercial and recreational fishing industries, all right, and there is one other I'm leaving out.

I guess, it is more sort of the feasibility side, right --

MR. ELSTON: Right.

COMMISSIONER JACKSON: -- the transmission of power and how you get into the grid and do the stuff I know nothing about, but Mike Winka will know.

It is our intention here, with the $4.5 million, because, again, those came from environmental penalties, to pick up the ball and do an RFP for the environmental work that needs to be done. The State still has other work and I think BPU and Congress are still intending to do those studies.

CHAIRMAN BLANDO: I am just

curious as to what your perspective is on the public's acceptance and willingness to do something through their own choices, consumer choices regarding energy efficiency.

COMMISSIONER JACKSON: Well, I think that's one of the things I hope continues to build. If there is momentum on the private side, there is certainly momentum on the public side.

To some people, the greenhouse gas movement is very much a green, grassroots kind of a movement. It came from people looking at a situation on an international scale and saying, Why aren't we planning?

And I guess Governor Whitman's editorial this week, I thought spoke very eloquently, that we need to lead, not to follow whether we believe we have a global challenge, which we clearly do.

I think people we are seeing, you know, there are mayors, hundreds, I think, in

New Jersey, maybe not quite a hundred in New Jersey, but hundreds across the country who have signed on to basically the ideals of a Kyoto Protocol for their town.

It's very hard to implement, though, on a local level, so we see varying mutations of it, but that's grass roots; that is because that's what, you know, people want to do. We are seeing encouraging signs, but we are also seeing signs that show we have a lot more work to do.

Last month they said gasoline usage was higher than it had ever been in our country.

Good for you and I'm happy, but I'm not.

I think what we really need to figure out is how to really see changes in energy efficiency and personal behavior.

California is probably as good a model as we're going to see across the country. They brag, and I haven't seen anybody say it isn't true, that their per capita energy remains constant in their state; whereas, everywhere else in the country has gone off the map.

CHAIRMAN BLANDO: Thank you very much, Commissioner Jackson.

Our next speaker is Michael Winka,

who is the Director of New Jersey's Office of Clean Energy.

MR. WINKA: Thank you and it is a pleasure to be here. It is a pleasure to follow Commissioner Jackson. She is so well spoken on the issue and such a great leader in combining energy efficiency and green global energy.

Thank you, Chairman Blando, and the Council for inviting us here and hearing what we have to say.

For me, it's almost old home week, I can remember talking to John Elston and Bill O'Sullivan about some of the things that we are doing and they would roll their eyes, What are you talking about.

Then I went over to DEP and talked to the folks at DEP about some of the issues on energy efficiency and how can we move this forward and connect them to greenhouse gas reductions. And they said, Okay, why don't you come over here and work for us, so it's been a great partnership.

To build on Commissioner Jackson's comments, it is a great team that you have here in New Jersey overall. You have Commissioner Jackson. President Fox at the BPU. You have Karen Franzini at Economic Development. Virginia Bauer at Commerce and Susan Bass Levin at DCA.

They are all thinking about how to make that connection between energy, environment and economic development that it just becomes natural to them that we do in the State of New Jersey, that you heard Commissioner Jackson say isn't a fight like you see in some other states having a turf fight or a fight about what are we doing with energy efficiency, how do we connect the programs, how do we move forward.

Basically, we are on the same page about moving those forward, connecting those things together, delivering programs to you so you can use those as tools in addressing reducing greenhouse gas emission.

I just want to pass on regrets

from President Fox, who couldn't be here. There is a couple of other presentations she is doing. Although she considers this to be one of the most important things on her schedule, unfortunately she couldn't be here.

I was at the Greenhouse Gas Conference that was at Princeton last week that Commissioner Jackson spoke at. And again, you heard what she had to say today. She was just eloquent about how she puts those connections together.

The Greenhouse Gas Conference was at the Woodrow Wilson Hall. And as you know, Woodrow Wilson was a favorite son in New Jersey. He was President of Princeton University, a governor. He created the Board of Public Utilities, which I'm thankful for because it now pays my salary, and then he happened to be the President of the United States, a little thing for a favorite son from New Jersey.

There is a quote on the wall, it was a dedication in 1914 when they opened the Goethals Bridge. He was addressing a group of engineers. And he said, The magic of engineering is that it can change the face of nations and show the world what it can be or could be and that the U.S. has made the world, because of its engineering creativity, uncomfortable.

You have to realize at that time you had Ford, you had Edison, you had Carney just changing the way the world looked in that sort of disruptive technology that we are talking about today.

How do you take some of these disruptive technologies and implement them and change the world?

He said, We do that by an extraordinary dynamic quality for the benefit of mankind. And that struck me. He said, The U.S. is not a static nation. It is one of the nations that wants to disturb the equilibrium. And I think that creative process has served us as engineers, as scientists well; that's mainly what we are at DEP. And I consider myself still an alumni of DEP, as many of you are on the Council.

I would say that served us well in terms of building bridges and dams and power plants and even sending somebody to the moon, but our mission today is no less than saving the world from ourselves.

I will let other people talk about

the greenhouse gas emissions reductions, but that's a given. We need to do this and we need to change the logic of what we are doing today.

Einstein said, you know, if you have a problem, you can't use the logic that got you into the problem to solve that problem.

I'll give you an example of how easy it is to solve that problem and I am going to then talk about how we can provide some of those tools to help you do that.

A hundred years ago, we weren't lighting our rooms with electricity. Edison came along and invented a little thing that you can hold electricity in your hand. It was a great little technology. You look around today, we don't light our buildings with natural gas.

Why was that?

It was not only taking that

technology, but delivering the financing.

Kessler came along with the Board of Public Utilities and the utilities regulations and said, Here is a way we're going to finance these great technologies to move them along; that's what I am going to talk about, that connection between economic development, environment and energy efficiency and renewable energy.

There is a whole bunch of slides. I am going to run through them quickly.

We have goals just like every other program. Commissioner Jackson talked about the new goals that we have in the program, 20 percent reduction of energy used by 2020.

Sue Vercheak is going to talk about the energy master plan and how we are putting these things together.

20 percent Class I Renewables by 2020, 2 percent of that with solar by 2020. And 20 percent -- you heard the greenhouse gas reduction goals that Commissioner Jackson talked about. They are all connected. It's all about energy. Energy is CO2; CO2 is

greenhouse gas emissions.

You have to do one of two things if you want to reduce your greenhouse gas emissions. You have to make it cleaner and you have to use it more efficiently. Those are the two technologies we have today, if you are going to meet the goals that the Governor has set, those long-range goals. And again, these are out-of-the-box initiatives that we have to help to do.

These are some of the tools that we're using to get there.

The energy master plan, Sue Vercheak is going to talk to that; that is a tool that puts all those things together on the energy side, transportation, heating, electricity, where are we today, what is going to happen over the next 20 years, what do we put in place to change that reality that is going to happen, if we don't do something.

The Clean Energy Program, that provides some financing and funding to do that. And I'll talk about some of the changes we're looking at, at the Clean Energy Program to help implement some of those things in the energy master plan.

You have the greenhouse gas initiative. And you heard Commissioner Jackson talk about that. It's going to develop a cap and trade program to help to finance those sort of changes in energy efficiency and renewable energy.

John Rhodes is going to be here later on this afternoon talking about what we're doing as a state, not only to say, You need to do this, but lead by example.

The thing I'm going to talk about is energy certificate trading and the way we can link these two things together with financing. And then, our programs are moving towards outreach and education, tools that you'll hear other speakers talk about, Energy Stars, Zero Energy Building, USGBC, LEEDs and other types of mechanisms and performance rating systems that you can use to help move things along, educate the public and restructure some of the issues.

That's the amount of money that we have in the program. It's a significant amount of money. We do this for four-year funding cycles. We are in the middle -- as you see, we are coming to the end of the second four-year cycle. We're in the middle of proceeding to decide what to do for the next four years, how to structure the energy efficiency incentives and the renewable energy incentives.

$1.2 billion over eight years is a lot of money. It is a lot of money, but when you divide that between 3.6 million customers in New Jersey, both on the electric and heating side, it doesn't work out to a lot of money, unless you're willing to say, This is a societal benefit charge. Over here, I'm going to develop something today, not everybody can get everything today. We're going to develop a solar system for you today; tomorrow we're going to build one on your house; the next day we're going to build one on your house and that's how we are going to move forward on this program.

What is the rate impact of that?

So a small impact on the rate, about a 1 to 2 percent rate impact over a four-year period of time, .25, a half percent impact per year. I can't tell you if that's significant or not; that's what the Board of Commissioners does, they add those adjectives. I'll let you define that and whether that is significant or not significant about whether that additional cost, on a, you know, $3,000 energy cost overall is significant.

If we can do that in New Jersey, why can't other states do the same thing?

When you put those sort of states together, you create a market, you create demand and you move things forward; that's what we're doing in the northeast level.

We have goals just like every other program. And we met our goals for every year both on the energy efficiency side with electricity, gas and megawatt hours of systems installed.

I am going to go through these real quick.

The presentation will be available on the DEP website. And I will deliver 25 copies of the presentation, which I forgot to do this morning.

I am going to go through these

real quick to get to something.

On the solar side, and I'll talk about this in a second. I'll actually -- here are our solar numbers in terms of the systems that we have put in place in New Jersey.

We started out with six systems in 2001. We installed last year over 1,000.

We started out with 9 kilowatts. We installed 17 megawatts last year.

A 300 percent growth rate every year. And you see the funding for the rebates, a 300 percent growth rate for the last four years in that program.

If we were on the Nasdaq, we would be on fire. I wouldn't be able to keep the stock on the market, but that's the growth rate we have in the small program we've developed. And if you can do this in New Jersey, you can do it in Pennsylvania, in Delaware, Massachusetts, Texas, Wisconsin.

These are the numbers that we put together in terms of the solar program. You see the number that we've installed, the projects that are in construction. And because it's so successful, the number of projects that are waiting in line for a rebate.

We've exceeded the amount of money in our annual budget. We have a line that's formed for next year's budget, the year after budget waiting for projects to be installed.

It's a great success, but we have to look at how we can change some of that and use some of that logic on the energy efficiency side.

One of the reasons we have that great success in the program is a renewable portfolio standard that says, If you are the supplier of electricity, I'm selling you an electron today, you have to have a certain amount of renewable in that portfolio that you're selling; that's the renewable portfolio standard that says you have to have 20 -- well, currently, in energy year 2009, 4 percent renewables and 90 megawatts of solar, .01 percent of solar.

You can see some of the costs of that to the bill payer on the electric side. And, again, I'll let you decide whether those are significant on a per person or per household per year number.

The way we meet compliance is we turn that megawatt hour that is generated by that renewable energy system and we give it a certificate; that certificate is then able to be sold into the market for the value of that greenness.

We've turned that attribute of that green electricity into a value. We have always said, Well, this is the avoided cost of the electricity from renewable. What we've done with the trading system that we've created is turned that into a value that then allows the generator of that renewable energy system, whether that's a solar system on your house, an off-shore wind system or a biomass landfill gas system that's built in Burlington County, you can get that value in that green electricity and then you can sell that to the supplier, they meet their compliance with our RPS obligation, the generator gets the money and they pay off the system; that's the way you built the entire power system that's out there today.

The power plants were built based

on financing. A power company went to the bank, got the financing. It was paid for by the rate payers. It's the same system that you're using here, except you're splitting that electron into two pieces or that electricity into two pieces.

You have the electricity, the commodity, that gets sold into the market, just like any other electron. And you use that value.

And then you have that certificate that has the added value of that environmental benefit, what is the greenness of that renewable energy. You take that, you give a certificate, which is a unique number, it's traded in the PJM system. In New Jersey, it's -- we use the GATS, General Attribute Tracking System in PJM. Pennsylvania, Maryland and Delaware, D.C., all the states in PJM use that same tracking system.

The supplier goes in there, buys the certificate or, says, Here is what I'm willing to pay for that. They strike a deal. They sign a contract. They get the certificate. They give the generator the money and he goes out and builds more renewable energy system or adds to the system that he has.

That's the value that could be

generated in that system on an annual basis in those years. $50 million in 2009. $126 million just for the solar side in 2020. More than we currently established for solar or in the program that we currently have.

When you match that up to a greenhouse gas trading emissions credit, those are somewhat of the equivalent numbers that you would have to get to generate the same amount of dollars if you had a CO2 cap and trade program.

This is based on a REC value going from $15 a megawatt hour down to $5. And a solar REC at $200 going down to $70. So a decreasing value over time, but you're increasing the number that you are required, which generates that value in the market.

The thing about this is that's not a pot of money that one entity in state government manages; that's money that flows through the economic environment. It's not a

pot somewhere that can be diverted somewhere
else for other uses, which in state government
we have a tendency to do. We have a dedicated
fund, somebody else comes along and says,

Well, I need that dedicated fund for something else and all of a sudden, it's not a dedicated fund.

We have no way -- and that's just in commerce, where those dollars flow through the generator and the supplier. We set up the renewable portfolio system. We set up the rules, which is good government. We give you the tools to do that and then you go out and build the facilities and finance the facilities and we're just setting up the performance standards.

This is just a chart of the value of those certificates over time. We track -- we do the trading on what is called the behind the meter, the small solar systems and we track the value that trade so people can understand what our system is trading for. This is just like any other trading market, just like apples, pork bellies, energy. They work the same way. They work just like any other stock that's traded on the open market and you can enter into futures markets.

The issue for us is to get to that 20 percent, to get to that 1500 megawatts of solar, we're not going to do that by buying our way out of that system. It's the same thing I was talking about on energy efficiency. We're going to do that by developing a new financing system that allows us to do that.

Here is why.

That's a typical 10 kW system, what it costs to install, what we provide in a rebate and that's what it costs the rate payer on an annual basis, the federal tax credit, your out-of-pocket costs.

So if you didn't have the solar renewable energy certificate system, it would take you 25 years to pay off that system. Your return on investment would be less than 2 percent. With that certificate trading system, your total savings is $3900, your pay back period is less than 10 years, your return on investment is about 10 percent. The cost for that trading system in 2005 was $0.14 per household per year; in 2009, comparatively, it costs approximately $1.40 per household per year.

We can increase that

significantly, that amount, increase the value of the RECs and reduce that amount and still move the systems forward in terms of being able to build systems.

What we're looking at is: How do we eliminate a total cost here that's a cost to the rate payer, move it on to a financing side that allows for financing and build systems on the financing side?

And you can do the same thing for energy efficiency.

I'll run through some of the programs that we offer. I'll give you the handout. And again, it will be available on the website. I don't want to run through these and take a lot of time.

We have a home energy analysis system, that you can go into our website, plug in your information. It will give you advice on what to do to save energy in your home and it will also tell you about our rebate programs.

We are managing a new program called Home Performance With Energy Star; that is, on existing buildings. For the 3.2

million households that are out there, we're developing a home audit system where we certify the contractors, they come in, give you a report on how to improve it. And we're developing the financing systems through the utilities and others that will help to finance those upgrades in that energy efficiency.

We do a warm advantage/cool advantage program, which provides rebates for heating, cooling systems, central air-conditioning systems.

We've been doing a Home Energy Star program where we provide a rebate to developers to build significantly above the current energy code.

One of the things we are doing is working with DCA to move this to code and take the money that we have in the Home Energy Star, which we have 20 percent of the market share currently and move that into the Home Performance with Energy Star program.

Sue Gander, who is from EPA will talk about that program probably a little bit more.

We do incentives on all -- a

number of Energy Star products. And we have a Comfort Partners program, which we do for low income. We go in there, test the home. Anything that is cost effective, we pay for 100 percent of that upgrade in that low-income home.

Last year we did 10,000 customers. We do about 6,000 customers a year, upgrading them and saving them an average of $200 on their energy bill.

One of the big programs that we have is a Smart Start Buildings program. It provides the incremental costs to go from the energy code to the next level in energy efficiency and provides that incremental incentive up to a cap of $100,000. We're looking at ways to change that.

We've done over 2,000 businesses on an annual basis that have upgraded and you can see the numbers in terms of energy efficiency.

We also have a combined heat and power incentive that pays for 30 percent of the capital costs for small up to 1 megawatt combined heat and power operations.

We do an upfront incentive to commercial businesses, up to $12,000 or working with them in developing their design and their energy efficiency above grade, above code, trying to get up front in the design process to make the changes in the overall design before they are into the design program.

And this is just a list of all the prescriptive technologies that we have design incentives for and rebates for.

We also have a custom measure program so if it doesn't fit on the prescriptive remedy, we work with the commercial customer in their retrofit program or their new construction program to develop an incentive that works for them.

We are trying to buy down, again, 80 percent of that capital cost of that energy efficiency measure and get the pay back period down to about 1.5 years.

Now, some of the new programs that we're developing is an energy audit for municipalities, local governments where we'll pay for 90 percent of that energy audit. It will come with a report to them. That report will say, You have to do those cost-effective measures and also help them in providing some of the financing for doing that.

We're developing a Demand Response and Load Management Incentive program to pay for some of those costs -- time of use meters and some of the other measures that add a little more cost into the program.

We're moving to zero energy building on the commercial/industrial side and looking at how to link our energy efficiency and renewable energy incentives together in congested areas.

A lot of what you're talking about in your high energy demand days that DEP is looking at, we're helping to link up those incentives to provide those reductions in the high demand days so we get the maximum environmental benefit overall.

So that's the overall program.

Here is what we're looking at doing.

If you are going to get to that 20 percent energy efficiency reduction, if you are going to get to that 20 percent greenhouse gas reduction, you can't do that just by setting a goal for energy efficiency and come along and say, Well, we have this goal that we set because we'll be here in five years, we'll be talking about the same thing.

If you want to get to those numbers, you have to set it just like the RPS was set in a portfolio standard. You have to say, That's a valuable force, I want to acquire that much energy efficiency and I want that to be delivered either through the utilities or the suppliers. And you set up that same sort of program that you have on the energy efficiency side that provides a certificate to help finance those upgrades on energy efficiency, the same way you built the entire power plant system that you have in New Jersey and PJM in terms of turning over that system; that's one of the things we're looking at doing within the energy plan.

It takes legislative changes to happen, but it is one of the things we would recommend the Council look at in terms of the overall energy goals of the program. If you are going to use energy efficiency as a resource, you need to say that. You need to say that legislatively, that I put a value on that resource and I want that resource to be acquired in New Jersey.

When you do that, you can set up that trading program and that energy efficiency portfolio standard in any way. You can split up that pie and say, I want a certain amount of that to come from residential energy efficiency, commercial energy efficiency, clean distributive generation, combined heat and power and load management. You set up the percentages you want, just like the RPS percentages, increasing over time, starting out small and building out over time. And you set up a trading system.

This is just -- we looked at some numbers of getting to a 20 percent energy reduction goal with an energy efficiency portfolio standard, assigned some value to that certificate and you can see how much of revenues that would generate or the amount of financing that would be put on the street in terms of developing an energy efficiency portfolio standard.

Again, the benefit of doing that is you don't have that pot of money sitting around. This is revenue that goes into the economy, as opposed to a pot of money sitting somewhere around.

With that, the key -- you can read through the numbers that we do, but the key here is we -- on the energy efficiency programs that we have in place, we're avoiding a little over 300,000 metric tons of CO_2 on an annual basis.

If you're going to get to the Governor's goal that number has to increase by two orders of magnitude.

Again, you're not going to get there with the programs we have today. We're not going to buy our way out with rebates or just a goal that we have.

When you include the cumulative

avoided emissions over the five-year period of time on the life of those products over time, that's a significant number, but that's still only 2 percent of that total CO_2 emissions that were emitted during that five-year period of time.

To get to the numbers we need to get to, you need to do something drastically different to be able to move those numbers along. We're willing to work with the DEP and the Council in helping to develop those goals.

The bottom line is you can get more energy efficiency increasing the building codes and appliance standards, including combined heat and power, clean distributive generation or renewable energy into your energy mix or you can have larger and larger transmission lines that will come into New Jersey, pay for power plants that are out of state, take your energy dollars that you have today and move them out of state because those are the solutions.

We're not going to let the lights go out in New Jersey. You have those options that you're looking at in the energy plan or you can do that in a way that helps you meet your clean air bill.

With that, that's our website and all the information is on there and I will answer any questions that the Council may have.

CHAIRMAN BLANDO: Thank you.

I just want to remind the council members to state their name for the benefit of our stenographer.

Rich.

MR. LYNCH: Richard Lynch here.

I have two questions for Mr. Winka.

The first is: On the home solar energy program that you have there, you described a payout period of 9.6 years or so.

I was curious what is the typical life of the solar system on the home; how long do you expect it to last?

And then, as part of that, when things start to break down, are there lower cost ways of bringing the system back up to speed without replacing it?

MR. WINKA: The panels will last

for 25 years. There is some degrading of the efficiency over time. So the pay back period is 10 years, you get 15 years worth of free electricity after that when the panels are paid off. It's not a bad deal. The efficiency does decrease.

So in 25 years, hopefully the price of those panels, well, not hopefully, the price of those panels will come down and you can afford to make that change out on your own in 25 years.

MR. LYNCH: And then the second question related to the other slide that dealt with codes and improving energy efficiency codes.

One of the concerns that comes to mind, and I wonder if you can speak to this, is as we move toward increased energy efficiency codes, it kind of reminds me, as an industrial hygienist, of the shift that happened after the energy crisis of the 1970s where the Uniform Construction Code and the BOCA codes moved from 15 cubic feet per minute of outdoor air per person, for example, down to a minimum of 5, which became the maximum of

5 by the architects. And it birthed a new term for us, which we now all are familiar with, called Sick Building Syndrome.

So one of the things I am kind of

concerned about is can you make any recommendations to us about how we can move toward improving those energy efficiency codes without bringing with it further reductions in the kinds of things that are necessary for health.

MR. WINKA: It is always that balance between the need to ventilate and the need to get energy efficiency. You don't want to tighten up the building without that ventilation, whether that's mechanical, whether that's, you know, an amplification (ph) system or a desiccation system that provides that. You have to balance out those two codes. It's not one over the other; it's a combination of those two.

CHAIRMAN BLANDO: Michael.

MR. EGENTON: Michael Egenton.

Mike, is the BPU offering any or is it engaged in offering any guidance or assistance to -- I noticed there's been a couple of news stories about homeowners putting solar panels on their homes. And they've gotten into a little debate and problem with their developments or homeowner's associations or things of the like.

I am just wondering, does the Board help them through that process because I guess it's gotten into an interesting debate of whether the panels are esthetically pleasing with some of these homeowner associations.

MR. WINKA: Beauty is in the eye beholder. I go down to Atlantic City and I look at those winds turbines and I think they look majestic. Somebody else is going to look at them and think they look ugly.

MR. EGENTON: Right.

MR. WINKA: We have folks that work with homeowner's associations and we can provide that access to the homeowner's association and let them take their course.

There is a piece of legislation that is moving through that will basically prohibit that from occurring, so there is a legislative path to make.

We try to provide technical assistance. If they are running into that issue to either go to the planning board, talk to the zoning board, talk to the homeowner's association and try to make that change over, but it is a balance between aesthetics.

DR. FELDER: Ken Felder.

Mike, one of your recommendations up there was to increase transmission lines and import electricity.

MR. WINKA: It wasn't my recommendation. I said, You can either pick that -- there is in the Energy Management Act of 2000, the feds (ph) and the FURP (ph) have corridors that they have to design. And they're picking corridors now in terms of congestion areas. And they're going through those analyses on transmission congestion.

There are two transmission corridors that they've identified coming through New Jersey, right through -- you know, all the way up through West Virginia, Virginia, Delaware, Maryland up through New Jersey, hitting New Jersey and

New York City with a 500 kV line and another one coming over through Pennsylvania and up through northern New Jersey, up across New York.

So you can either build those and that line is going to cost you $3 billion. So you have that option of building that or reducing your load.

Those are the two options that you have currently because you've got to keep the lights on; that's the important thing that you have to do.

So you have to balance that, do you want to pick that larger transmission line or do you want to pick energy efficiency and reduce your load or is it a balance between those two.

Nobody is saying from the Board that you shouldn't upgrade those lines and keep those lines upgraded and in appropriate performance, increasing their efficiency, but you're coming to a decision point that we're all going to have to make in terms of where do you want to put your resources; that's the limiting resource we have is that dollar on what option do we want to pick because once you pick that, you're going to pay for that for the next 25 years.

MR. THOMAN: And that option deals

solely with the problem of congestion versus --

MR. WINKA: It's congestion. It's reliability. It's --

MR. THOMAN: -- any improvements in environmental issues?

MR. WINKA: Well, it's AEP, who is building a coal-burning power plant in West Virginia, who is sending that power up to us. So you are going to get those CO2 emissions somewhere.

So, again, it's all a balance. So you need to enter into that debate and decide where you want to spend your resources in New Jersey.

Do you want to send your energy dollars out of state to buy that?

It's a question we all have to address.

MR. THOMAN: Understood.

I guess another point that goes

hand in hand with that would be the issue of the participating states in the RGGI program and the states that are not participating and that we are importing that electricity from a state that is not.

MR. WINKA: Right. And that's, you know, that's an issue that you're -- I don't think anybody here is talking about RGGI, but that is an issue where you're looking at a leakage, where does the leakage go.

Energy efficiency is an option to reduce that leakage issue. If you can reduce those offsets and allowances through energy efficiency, then the amount of money that is going to out of state imported electricity becomes lower. And it's jobs that you're building in New Jersey.

CHAIRMAN BLANDO: Jim, the next question.

MR. SPATOLA: Joseph Spatola.

Michael, for these energy efficiency designs for homes and offices, who in BPU is evaluating those designs and what are their qualifications?

MR. WINKA: Sure.

We do that on an annual basis. We hire a third-party evaluation. We use the Center For Economics, Energy and Environment

Policy, that's CEEEP and the Bloustein School to manage those contracts. So they're evaluated for us third party, separately. They look at a cost-benefit analysis, a market assessment, a program-impact assessment.

We do that on an annual basis to determine how we should change the portfolio programs we have, are they cost effective, are we delivering them in the right way.

So they are -- you know, they are an arm's length evaluation. We accept those reports. We don't get to change the recommendations in those reports. And again, we manage them through Frank's program up at CEEEP. We put out the RFP. We hire the company. We ascribe that over to CEEEP and they do the evaluation for us.

CHAIRMAN BLANDO: Mike, I just have -- maybe I'll take the last question.

Just with regards to bio fuels. I've always been a little skeptical and concerned about the air emissions from the utilization of bio fuels, although I've seen some data that is a little bit more reassuring.

I've also been curious because that's part of the renewable portfolio, if one were to look at, say, the mass balance, the carbon mass balance of bio fuel derived from agriculture sources, I just kind of still feel skeptical that the output utilization of the bio fuels, that what's going out, that you could actually make that up by growing, for example, plants to make that. I'm always curious about how that actually is a renewable resource.

MR. WINKA: There is a good article in Science that helped pull all of those things together.

I don't know on the bio-diesel side. I haven't seen that analysis.

On the ethanol side, it all depends on the technology you're using. Are you using pulverized coal to derive that energy, to drive that ethanol plant, you know. And it all depends on whether you're accounting for the byproducts that are generated from that in terms of feed products and the reductions in that.

It all depends on how you do the

life cycle, what technology you use. And that's part of the program. You're going to say, If I want ethanol, I want it derived from this source and I want the endpoint CO2 to be less.

Overall it takes more energy to deliver ethanol electricity overall on a megawatt-hour basis when you do the mass balance energy efficiency. And nobody comes around and saying we should be replacing electricity with something else, so...

CHAIRMAN BLANDO: Great; thank you.

Our next speaker this morning is Susan Vercheak. She has served both the DEP and the BPU as a deputy attorney general. She holds a bachelor's and master's degree in history from the University of Washington and a law degree from Rutgers University in Newark.

She is currently assigned to work

on the New Jersey Energy Master Plan.

Susan.

MS. VERCHEAK: Good morning.

Thank you Dr. Blando and members

of the Clean Air Council.

This is a rare opportunity for a deputy attorney general to, at least, address policy issues so I warn you this will be the shortest and least technical presentation you'll hear today.

I am here to speak about the overview between the energy master plan and the clean air concerns of the Clean Air Council.

As you've already heard in Commissioner Jackson's presentation and Mike's presentation, every time anyone talks about energy, it's not just their particular agency or that particular segment of society that's being addressed.

The point of the energy master plan is to try to bring all of these disparate pieces together to develop a master plan for the State.

Others, who are far more

knowledgeable than I, like Mike, Commissioner Jackson and all the other speakers will talk about more of the technicalities. What I want to emphasize today is the importance of the clean air component within the Energy Master Plan's goals, which are developing and implementing a plan for affordable reliable and environmentally sound energy in the State of New Jersey.

As Mike's answers to questions revealed, there are consequences in everything that anyone does. Any solution that the State offers in terms of anything, has its problems and it impacts other sectors of society and our community so nothing is easy here, but the goal of this plan is to bring everything together in some sort of a harmony.

And I don't need to tell this group the importance of energy throughout the State. It drives everybody's lives. It drives the economy. It affects the globe. It's become an extremely important issue to everyone.

Since I'm a lawyer, on the procedure of the master plan, the Governor announced in October, Governor Corzine announced in October that he was beginning the Energy Master Plan process.

There is a EDECA statute, which

establishes the Energy Master Plan process. It was put in place in the 1970s during the last energy crisis. And, quite frankly, it gets ignored more than it gets paid attention to, but because of Governor Corzine's recognition of the challenges facing New Jersey, the energy challenges and the environmental challenges, he announced this initiative in October. And in the next year the Energy Master Plan will have been developed.

The Board of Public Utilities and the Governor's Office of Economic Growth are the co-chairs of the proceedings.

The master plan is a public and collaborative process.

In January, there were a series of public hearings throughout the State attended by many of the Commissioners involved in this.

Since then, there have been many, many working group meetings held by different of the agencies. The Board of Public Utilities alone has five different working groups who are working on various components of energy issues.

The draft of the master plan has to be done by early January, not January, early July, but it will probably be done sooner; that will be made public.

There will be public hearings on the draft in September and the final plan should be done in the fall.

Obviously, what the plan must do is to try to harmonize all of these competing interests. It is doing that by looking at a variety of components, such as the energy efficiency might describe appliance and building codes. Renewable energy, transportation elements aren't so much of a focus of this proceeding, but that is being considered, as well.

And this is my one visual aid.

The hardest thing in government, as anyone who is in government or who has worked with government knows is to coordinate government. And I noticed -- this is my visual aid -- in the brochure for this meeting today one of the challenges is that "government policies should encourage a coordinated and holistic approach to energy efficiency and should incorporate these concepts into economic and environmental programs."

As a government lawyer, within the tiniest division of the tiniest agency, it's not rare for one person at one desk not to know what the person is doing at the desk next to him or her.

It's incredibly more difficult to coordinate all of these agencies with their competing values, transportation wise, to build growth. DEP wants to keep the air clean. Health wants to make everybody healthy. And, you know, there are tensions here, so the goal is to harmonize all of these things.

All of these agencies are trying to work together with the public, with the various members of the community, with different regulated groups, unregulated groups, the business community.

Business and the economy of the State will not survive unless energy is made cheaper so that jobs stay New Jersey.

The goal of this master plan is

for it to be a working and implemented document, which is a high goal indeed for a government paper. Usually, they just sit on someone's shelves long and forgotten, but it is the goal of this.

If you are not involved in the master plan, there will be -- as I roughly described, there will be more proceedings. There are working groups. There is a website. I think -- I just Google. I just never remember sites. You can just type in New Jersey Energy Master Plan and there is a pretty comprehensive website which sets forth the goals and the working groups and the schedules and the drafts and the different comments and reports which have been submitted thus far.

A number of other speakers today will be addressing other components which are part of the master plan.

John Rhodes will be addressing

energy efficiency within the State government.

Dr. Frank Felder is here somewhere to address the modeling process that is being used.

And.

Seema Singh will be here to speak on behalf of the Public Advocate because all of these rates we all pay and somebody has to be looking out for how much these things cost.

So with that, I would like to thank the Council very, very much. And I think this program is an incredibly important part of the education component that has to occur for any of this to be even remotely successful.

All of us in this room are paying attention to these issues and we talk about it all the time. It's important to remember that it's not part of everybody's lives to use terms like RGGI and energy efficiency and renewable energy and all the terms that we're so comfortable with, but I do think change is in the air.

I think Commissioner Jackson discussed it a bit, there is, you know, a turning here. I think we should feel optimistic and participate as much as we can.

I will try to answer questions, but I will probably try to avoid answering terribly substantively.

CHAIRMAN BLANDO: Any questions from the Council?

John.

MR. ELSTON: I'm John Elston.

I would like to thank you. This is the first time I've heard from the panelists this morning on the hard part, working within the different agencies to get sorts of agreement.

I guess, to get to the heart of the question, it is that if we can't get the agencies to agree on a plan, even though the Governor signed EO-54 and various other plans, which are fairly specific plans, that certainly, if we can't get the inter-agencies to agree, the lobbyists will eat up the different agencies and then eat up the whole plan that we're trying to do.

I guess, from my perspective, we certainly need a lot of fortitude on your part and on behalf of all the State agencies and the Commissioners of those agencies in order to achieve that and, particularly, the two new words that you brought up, energy reliability and energy affordability because there may be some slippage in those two.

MS. VERCHEAK: Yes.

MR. ELSTON: And I was curious as to is the BPU willing -- or do you think there is a willingness to accept some of those aspects?

MS. VERCHEAK: The people who are working on the master plan are working on all elements of addressing energy problems from building more transmission, improving transmission, building more generation, not building more generation, avoiding more generation with energy efficiency.

Everything is being looked at and everything is being analyzed with an eye towards what it actually costs and what the fall out is. I can say that everything is being looked at.

You're right, it is very, very hard. And it will take a lot of fortitude by people at a higher-paid rate than I am at, but I can assure you that everyone in state government who is working on this is committed to the struggle of coordinating it and harmonizing our different perspectives to bring together a proper goal.

This sort of public education and bringing it out beyond what we do is really, really important toward giving people fortitude, I think.

CHAIRMAN BLANDO: Thank you, Susan. Oh, do we still have -- oh, George.

MR. BERKOWITZ: I am interested in the process.

Who is writing the master plan; and, how is it being vetted with the stakeholders?

Is the only opportunity for the stakeholders to have input is during the formal hearing process?

MS. VERCHEAK: No.

The plan will be written, effectively, by the chairs of the plan, the office of economic growth and the board of public utilities.

Besides all of the working-group meetings, which are in progress, comments can be submitted at any time through the website.

In addition, before the draft plan

is written, there will be a series of meetings with various stakeholder groups so that a shocking new plan isn't just sprung on people, not that it will be shocking. I meant that to be very facetiously.

There certainly is the intent to make it as transparent and as collaborative as possible.

MR. BERKOWITZ: Thank you.

MS. VERCHEAK: You are welcome.

CHAIRMAN BLANDO: Thank you, Susan.

MS. VERCHEAK: You are welcome.

CHAIRMAN BLANDO: Our next speaker today is going to be Dr. Anthony Broccoli, who is Associate Professor of the Department of Environmental Sciences at Rutgers University, where he currently serves as the Director of the Center For Environmental Prediction and director of the graduate program in atmospheric science.

I think Dr. Broccoli will emphasize from the environmental standpoint why this is such an important and crucial issue.

Dr. Broccoli.

DR. BROCCOLI: Let me begin by thanking Dr. Blando and the members of the Council for inviting me here to speak this morning.

I'm speaking about this issue because I think that this is the number one environmental issue of the 21st century. The effects of increasing gases on our climate are so wide ranging that they will effect everyone. And, I think, in particular, in a coastal state like New Jersey, a state that is very dependent on water resources, both for public consumption and, also, for the success of our economy, the impacts of climate change will be felt and are probably already being felt.

We'll start with the basics.

The amount of carbon dioxide in the atmosphere has been measured at the Mauna Loa observatory in Hawaii. It's pictured here at the top.

This is an area where the trade winds deliver relatively clean air. There is 2000 or 3000 miles upstream without any smoke stacks or tailpipes. And so when we measure the amount of carbon dioxide in the atmosphere at Mauna Loa, we are measuring what is representative of our atmosphere as a whole.

When the measurements began in 1950s, the concentrations were about 315 parts per million. They are now at or approaching 380 parts per million. This increase is a result of the burning of fossil fuels and the emission of carbon dioxide into the atmosphere by human activities.

We can go farther back in time to a period long before we had these scientific measurements, thanks to the work of geologists, who drilled into the ice in Greenland and Antarctica. And the ice there is, of course -- really starts out as snow. And as that snow accumulates -- snow is fluffy. It has air trapped in it -- the weight of each succeeding season's snow on top of the snow beneath it compresses that snow into ice, but it traps air in the form of bubbles in the snow; that air can be examined as a record of what the atmosphere contained many, many years ago.

So each of the little colored symbols on this diagram represent measurements of the carbon dioxide content of this trapped air from various locations in Greenland and Antarctica going back over a thousand years.

And what this shows is from the Middle Ages up and to the time of the Revolutionary War the greenhouse gas content, the carbon dioxide content of the atmosphere was very stable at around 280 parts per million.

And then when we started to burn coal at the time of the Industrial Revolution and then, in the 19th century, after that, oil and natural gas later on, these levels began to rise and the orange line in the upper-right hand corner of the picture shows the measurements from Mauna Loa.

The measurements overlap these observations during the period where we have both types of measurements, showing that this is a reliable way of knowing what has been going on with greenhouse gases in our atmosphere, not only for the past thousand years that I've shown here, but other ice cores have been drilled that give us samples of our atmosphere going back 650,000 years.

What they show is that during that entire time prior to the Industrial Revolution, the concentrations of these gases never rose much, about 280 or 285 parts per million.

So we're really in territory now that the earth has not seen for at least 650,000 years and probably much more than that.

At the same time, temperatures have been rising. We've had enough thermometers measuring temperature around the world to have good observations going back about 125 years or so.

During that period of 125 years, we've seen a rise in temperature of -- more gradual during the early part of the 20th century, a bit of a leveling off from the 1940s through the 1970s, in part, because of increasing traditional pollutants. I'm not talking about CO_2 here. I'm talking about soot and other forms of industrial pollution.

And then from the 1970s on through

the present, we see a much more rapid increase in temperature has been taking place.

The world's climate scientists have been called upon to try to understand the relationship between these increases in greenhouse gases and the increases in temperature.

We don't believe that carbon dioxide is changing the climate simply because we have two sets of curves that are rising. We know from fundamental physics that carbon dioxide makes it more difficult for the earth to emit infrared radiation to space; that's the mechanism that balances the heat that the earth receives from the sun. And if we make it harder for these longer wavelengths of radiation to be emitted from the earth into space, that is expected to warm the climate.

I mentioned the world's climate scientists. And for about the past 15 or 20 years, the world's climate scientists have been organized in an activity known as the Intergovernmental Panel on Climate Change, under the auspices of the United Nations.

The purpose of the IPCC, as we

more typically call it, has been to try to assess the state of our scientific understanding about climate change.

You may know that the IPCC has been releasing a set of reports, again, this year, many of which have made headlines over the past couple of months, but I want to look a little bit farther back in time and give you a little bit more of a historical perspective.

In 1990, in the first assessment by the IPCC, their statement was, "The unequivocal detection of the enhanced greenhouse effect from observations is not likely for a decade or more"; that was in 1990.

Then five years later, they said, "The balance of evidence suggests a discernible human influence on global climate."

This is a very measured and qualified statement. The "balance of evidence" obviously implies that the evidence is not unequivocal. "Suggests" is a soft word. And it talks about a "discernible human influence," not a large human influence. It's eyes not quantifying the size of that influence. However, there clearly had been a change that by 1995, more evidence was accumulating that led them to make this stronger statement.

In 2000, a much stronger statement, "Most of the observed warming over the last 50 years is likely to have been due to the increase in greenhouse gas concentrations."

"Likely" in the parlance of IPCC means a probability somewhere between 60 and -- 66 and 90 percent.

But just this year, their new summary statement is that "Most of the observed increase in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations."

"Very likely" defined as a greater than 90 percent chance.

So our confidence and our understanding of this issue has been growing. It's been growing because we've developed better models for simulating the climate system. It's also become more confident because we've had more data. There has been more time to see the continued increase in temperature consistent with what our models have predicted.

So when we look forward towards the future, in order to make projections of how the climate will change in the future, we also need to know what will happen to greenhouse gas emissions.

And, of course, that involves making a prediction itself. And that prediction involves trying to understand human behavior, trying to understand economic and technological changes.

So the approach that economists, social scientists, engineers have taken to this problem is to develop a set of scenarios of carbon dioxide emissions.

The diagram on the left shows a number of different scenarios for carbon dioxide emissions over the next 100 years or so.

All of these scenarios show increasing emissions during the next several decades. Obviously, there are differences in the rate of increase of emissions.

By the way, all of these scenarios assume that there will be no government intervention, no regulatory efforts. And from some of the things that we've already heard today, that assumption may not be correct, certainly is not correct on a local level, whether it applies globally remains to be seen.

The levels today are about 8 gigatons of carbon per year, so depending on which scenario we look at, that could either triple or more to 25 to 30 gigatons per year by the end of the century or possibly peak in the middle of the century and then start to drop off dramatically.

It's important to recognize the distinction between emissions and concentrations.

Unlike some air pollutants, carbon

dioxide accumulates in the atmosphere. It has a very long lifetime, on the order of a century or so.

So that even though we have some

scenarios that show decreased emissions in the latter half of the 21st century, even under the most aggressive reduction in greenhouse gas emissions, carbon dioxide would rise to about twice the value it had during the pre-Industrial times. And under some of the more high-end emission scenarios, the greenhouse gas levels could even rise to three or four times pre-Industrial levels.

Now, when we put these different scenarios of climate change into our climate models, we, of course, will get different scenarios of the future evolution of temperature.

Now, the black line in this curve shows climate simulations of the temperature changes to date. And even though the scale is a little bit different, those changes match very closely what has happened in the real world.

I'll ask you to ignore the gold

line for now, that refers to something else that I may have time to talk about later.

The blue, green and red lines represent three of the scenarios that we saw on the previous slide. And depending on which scenario we look at, we see rises in temperature on the order of a degree and a half Celsius at the low end to as much as 4 degrees Celsius at the high end. The little shaded areas around each central line represent some of the uncertainties that are associated with our understanding of the climate system.

And 1.5 to 4 degrees, to put that into perspective, the warming during the course of the 20th century was about eight-tenths of a degree. So even at the low end, we are talking about twice as much warming in the 21st century as we saw in the 20th; and at the high end, we're talking about something like four or five times as much warming.

As I said earlier, the different colors represent different emission scenarios.

If you look at the gray bars on

the right, they represent some idea of how different climate models vary for the same emission scenario.

So there is some uncertainty

associated with our understanding of the climate system, but it's important to note that we have no evidence from the models that we've run that the climate changes we'll see during the 21st century will be less than double what we saw during the 20th century.

Now, these climate changes have a lot of potential impacts, far too many impacts for me to talk about in the time that I have available this morning.

I am going to focus on a couple of those impacts that I think are particularly important to New Jersey.

In the next talk, you'll hear about some other impacts on human health both through heat-related mortality and impacts on ozone.

I'm going to focus on a couple of changes that are, as I said, particularly important in New Jersey because we are a coastal state and because we are heavily dependent on our water resources.

This is what much of the New Jersey coast looks like.

It's true that most of these homes

are not primary residences, although some of them are, but they certainly are second homes to many people in New Jersey, including the people you see lining the beaches on this presumably sunny weekend afternoon in the summer. A lot of this property is very close to sea level. Our coastal tourism industry is a big part of the New Jersey economy. And this real estate is at risk due to sea-level rise.

Sea levels have been rising. This is the record from Atlantic City that goes back to 1912 or so. And over that period of time, if you're not that excited about meters and would prefer English units, sea level has risen about a foot at Atlantic City, fluctuations from year to year mainly due to the weather, but a very, clear, very evident long-term trend.

This rise of about four-tenth's of a meter can be partitioned into two components.

One component is global sea level rise accounting for a little bit less than half of the total.

The other effects represent the subsidence of the land here in New Jersey; that is something that varies quite a bit from region to region. In New Jersey, the land is sinking a bit and that accounts for a little bit more than half of what we've seen during the course of this century.

I want to focus on global sea level rise because that's the part that is associated with climate.

Global sea level is rising for three reasons.

One reason is thermal expansion, simply put, warm water takes up more space than cold water. Its density is less so it takes up more space.

The graph on the right shows variations in the amount of heat going into the ocean over the last 50 years or so. And it shows that throughout the entire top three kilometers of the ocean, the amount of the heat in the ocean has been increasing; that's going to reduce the density of the ocean and make it take up more space so that's one component to sea level rise.

Another component of sea level rise is the melting of glaciers and ice caps. Here, we're talking about ice that is located on land, not sea ice. When sea ice melts, it doesn't raise the level of the ocean; but when land ice melts, it does.

This complicated graph on the right that it is a little hard to see the details of simply shows how glacier volumes have been changing in various places on the earth, from Sweden and Norway through Iceland, the Canadian Rockies, Switzerland, the Alps and some of the tropical glaciers in New Guinea, South America and Africa.

Virtually all of these glaciers have been reducing their volume during the course of the last few centuries; that water is melting, it flows down the rivers into the ocean and that's increasing the volume of the ocean.

And then a third factor are the

big ice sheets that cover Greenland and Antarctica. They are melting and there is calving. Calving is what we call the process of pieces of ice breaking off and floating off into the ocean.

Over the past several years, we've had numerous stories about big pieces of ice breaking off, usually they're compared to the size of Rhode Island for some reason; but as you can see, this process is taking place. Here is a picture of a melt water stream on the surface of the Greenland ice sheet. The water is going down into a deep hole called a mulan. When that water reaches the bottom, it lubricates the interface between the ice sheet and the rocks below and that can make the ice surge into the oceans.

This is an area that we would like to know more about that scientists are studying very intensively at the moment, but our understanding of this process is not as good as we would like it to be.

The IPCC has looked at the history of sea level changes. The red portion of the curve represents observed sea level changes for about the past 130 or so years, a rise of about two-tenth's of a meter globally over that period of time and then the blue band represents the projections of the IPCC for sea level rise during the 21th century anywhere from about a quarter of a meter to roughly half a meter. So we're talking another maybe 1 to 2 feet, 8 inches to say 18 inches of sea level rise.

It's important to note that this does not account for the possibility of glaciers surging from Greenland and Antarctica out into the ocean, which would raise sea level much more rapidly.

The impacts on New Jersey.

This was based in part on a study done at Princeton University. The red colors represent 50 percent probability sea level rise. In other words, about six-tenths of a meter; that's taking the IPCC global estimates and adding the effect of the subsidence of the land in New Jersey. If that were to happen, the areas in the land diagram colored in red would be permanently inundated. So some of the Delaware Bay Coast and some of the back bays from Ocean, Atlantic, Cape May Counties and even a little bit of the coastal Raritan Bay.

If the ice sheets surge and sea

level rises by 1.2 meters, which these scientists assessed had about a 1 percent probability; then, in addition, these blue areas would be inundated.

The land inundated isn't the only story. When we have big storms, that also raises the level of the ocean.

So in the diagram on the right, these would be the areas affected by storm flooding from a sort of 30-year type storm. And the more extensive red areas cover most of the Delaware Bay shore, most of coastal Ocean, Atlantic and Cape May County and a good part of the Meadowlands, coastal Ocean County and Coastal Middlesex County.

If the higher-end scenario occurred, the blue areas would also be affected. I'll point out this blue area here because my plane landed there yesterday evening; that's Newark Airport, not very far above sea level so significant impacts on infrastructure are also possible from sea level rise.

Okay.

Another effect of climate change,

potential effect of climate change is water resources; and, in particular, floods and droughts. Pictured in the upper left, that's the Hyatt in downtown New Brunswick immediately after Hurricane Floyd. The rooms on that side always had views of the river, but until that time, you had to look out a little farther. Of course, all joking aside, a very serious event that impacted a large number of people in the Raritan River Basin.

On the right is one of the reservoirs that serves not New Jersey directly, but New York City in the Upper Delaware River Basin. This was only two years after Floyd in December 2001. It doesn't even look like a reservoir. It just has a small stream flowing at the bottom because it was at 1 percent capacity at this time.

And quite paradoxically, global warming brings with it the prospect of both floods and droughts.

To understand the reason, we have to think about the hydrologic cycle. This is the process through which water cycles through our climate system. Water evaporates into the atmosphere; that water vapor condenses in the form of clouds. If the cloud droplets get large enough, that turns into precipitation, that precipitation, whether in the form of rain or snow, falls on the land in the form of rain. It runs off into rivers and streams, groundwater, some of which we utilize for human consumption, the rest flows back to the ocean.

If it's in the form of snow, the snow will remain on the land, melt in the spring and, again, fill our reservoirs and streams.

Climate change has the prospect of increasing both the rate of evaporation and the rate of precipitation.

So when you hear that, you might say, Well, increased evaporation, increased precipitation, sounds like a balance to me. And it is a balance globally; but locally, that may not always be the case because we know that we get floods when we have a lot of precipitation in a short period of time. More precipitation in that same short period of time can mean more flooding.

We get droughts when it doesn't rain for a long time and evaporation takes moisture out of the ground. If evaporation is occurring more rapidly, that can lead to more frequent or more severe droughts.

The climate models project that there will be, also, regional changes in precipitation.

The two pictures here, the one on the left is for northern hemisphere winter. The one on the right is northern hemisphere summer. The blue colors indicate places where there will be more precipitation. The orange or brownish colors represent places where there will be less.

New Jersey is right on the edge, maybe a little bit more in the winter, maybe a little bit less in the summer. But superimposed on these changes will be, as I've said, what happens when we have periods of either heavy rainfall or light rainfall.

And this is a very busy chart. I don't expect you to read it all. I am just going to point out a couple of highlights.

The IPCC suggests that the

frequency of heavy precipitation events will very likely increase during the course of the next century, very likely means greater than 90 percent chance; and that the area affected by droughts will also increase, they regard that as likely, meaning, 66 to 90 percent chance.

To illustrate something that could be indicative of what may be coming in the future, these are plots of the annual flood stage of the Delaware River right here in Trenton. So each circle represents the maximum of rate of flow of the river for each year for the past 120 or so years.

So we have a lot of floods. The floods are the dots above this red line. This is the big flood of 1903, another big flood in 1955, which is the largest on record at Trenton; but interestingly, we've had three of the top eight floods happen in the past few years.

Now, it is totally irresponsible to try to say that this is caused by climate change because we don't know that. There is no way to attribute a specific flood event to climate change. But what I would say is that these floods are indicative of the types of changes that may be possible in the future, as our hydrologic cycle becomes more active.

Now, there is more climate change in the pipeline. I've showed you already some of the projections.

If this is the warming we have had so far during the course of the 20th century, we will definitely get an additional warming, even if we were to stop emitting carbon dioxide today.

The reason is that our current climate is not in equilibrium with the amount of greenhouse gases we currently have in the atmosphere. So there is going to be a couple of tenths, maybe as much as four-tenths of a degree of additional warming, even if we stopped emitting CO2 today, but we're not going to stop emitting CO2 today. And every molecule of CO2 that we emit into the atmosphere from today on will have associated with it increased warming.

In some of the lower-end scenarios that I showed you before, that warming might be about as large as I've indicated in the gold line there relative to today. But for some of the higher-end, business-as-usual scenarios, that warming would go right off the top of this chart and on this scale, right up through the ceiling of the room.

How large that gold arrow becomes is a consequence of what we do after today.

So how can we manage climate change?

Well, I would say there are four key areas to consider.

One of them is leadership. We need to raise public awareness of the challenges that are posed by climate change. I think that process is underway, I am happy to say.

There is going to be a need for society to attempt to mitigate, at least, some of the most harmful changes and adapt to the changes that we can't avoid.

Mitigation means reducing the emissions of carbon dioxide and other greenhouse gases. There are many ways that this can be done. We've already heard some discussion today about development of alternative sources of energy like solar and wind and, also, ways of conserving energy, both of which contribute toward mitigation.

There are other possibilities, as well, including carbon capture and storage and the development of other technologies that could be used for producing energy.

Adaptation is also going to be required.

There is more warming in the pipeline. The climate is going to change and there will be a need for society to increase its resilience to climate change.

Involved in all of these different solutions is knowledge. We need to develop a better understanding of the details of future climate change because there are questions of cost associated with mitigation and adaptation. And we want to make sure that we really understand what our climate future looks like so that we can make wise decisions about how to mitigate the effects of climate change and how to adapt to those effects.

So with that, I'll thank you again

for inviting me and take any questions that the Council may have.

CHAIRMAN BLANDO: Ferdows.

MR. ALI: Dr. Broccoli, what a nice presentation.

My name is Ferdows Ali.

The statistics, the numbers you get, obviously, there are some skeptics that are saying things the other way around.

Did you consider in your modeling that the benefits that the global warming might give you in terms of heating bill savings and the allotment of new areas for development of property; also, the more temperatures that you have mentioned may also increase the evaporation rates so that might balance out some of the negative impacts of sea level rise.

Did you consider those other sides of the story and give some numbers of what would be the benefit in overall cost and

overall impact, rather than looking at the
negative side of it?

DR. BROCCOLI: Sir, first of all,
let me say, my specialty is as a climate

modeler so it's not my job to assess the costs of the impacts of climate change.

There are other scientists, both social scientists and natural scientists who make such assessments. I would direct you to the report of IPCC Working Group 2. The summary for policy makers was just released last week for more information on this topic.

The last question, first, evaporation has no effect on sea level because that's part of a cycle so whatever increased evaporation comes from the ocean is quickly returned to the ocean by the hydrologic cycle.

In terms of the impacts of climate change, there is no doubt that there will be both winners and losers in terms of the effects.

The simple breakdown into winners and losers, though, is complicated by many things, including the fact that it is not entirely benign, let's say, for, to use an example, the wheat-producing region of North America to move from where it is now to some other part of North America.

The Canadians might like the fact

that they will be able to grow more wheat, but we, in the United States, might not benefit from that economically, especially in regions where wheat growing is big.

On the heating side, yes, we'll save energy by not having to heat our houses as much, but this building and most buildings that we occupy today are also air conditioned. I don't know about the overall statistics, but I know that for my house, a one-degree increase in temperature has a bigger cost in terms of air conditioning, than the savings in terms of heating. I think we would have to look more generally at impacts to know whether or not that applies more broadly.

And, in addition, there are many ways in which society has adapted to the current distribution of climate. So even if changes -- I mentioned agricultural changes before, but even if other changes take place that could be regarded as beneficial, for example, less need to spend money on snow removal in places that will get less snow, of course, we built ski resorts in a lot of those places.

So the question of assessing winners and losers is not so straightforward, but it's very hard for me to think of any winners associated with sea level rise, unless it's people who own inland property, who will have beach-front property in the future.

MR. ALI: Thank you.

CHAIRMAN BLANDO: Joyce.

MS. PAUL: My name is Joyce Paul.

There are two new books that I wouldn't even pretend to say that I read, but I read about, one is by a Danish physicist, Henrik Svensmark and another by Siegfried Frederick Singer, who both contend that the global warming that you're predicting and that we're seeing perhaps is not due to human activity and that is an important question because it is an issue of how we manage it. But they say that the global climate models can accurately register cloud effects and that the -- I don't even know if I'm getting this right.

DR. BROCCOLI: So far from what I've heard, you're correctly characterizing the beliefs of those books, yes.

MS. PAUL: And the cosmic rays vary your temperature by creating more or fewer of the low clouds that cool the earth and that, in fact global, warming is really a long natural process having nothing to do with our use of coal or anything else that we do.

Can you speak to that a little bit?

DR. BROCCOLI: Sure.

The problem with those hypothesis is that they have virtually no evidence to back them up.

People can write books and they can say what they believe; but, of course, in science, we try to make judgments that are based on the evidence. Svensmark and others have speculated that cosmic rays affect the distribution of clouds on the earth.

The evidence is support of that hypothesis is sorely lacking. There is no explanation of how this process works and the putative correlations between cosmic rays and cloud cover that appeared to exist for a short period of satellite cloud observations, melted away when a longer period of observations was used so I really don't think that those arguments hold water.

The IPCC is a process in which all of the world's climate scientists are participants because in addition to the people who write the reports, and those number in the hundreds of climate scientists, they survey all of the published papers on climate change and on the effects of human activities and natural processes on climate and I've conveyed their conclusions to you already.

I'm reminded of a debate that took place, you know, 50 or so years ago in the world of geology about whether or not the continents were moving. This was heresy because, of course, the continents aren't moving, right? I mean, what could be more silly than these gigantic blocks of rock moving on the earth.

Well, it took many decades for all geologists to be convinced that this was happening. Today, of course, it's taught in any geology department in any university in the country.

So there will always be a few

people who disagree, even some people with good scientific credentials, but I think the weight of the evidence is enormous in favor of the perspective that I've provided today.

CHAIRMAN BLANDO: Elease.

MS. EVANS: Each year we have hearings, we talk about what is going on, air quality, a lot of things. And I see you have up there, raise public awareness as a challenge.

How do we get this message out?

We talk about all these important issues and it sounds like we're at a critical stage now, but we're not -- the pattern of our lifestyle is not changing. And even with all of the cars and all the things we have on the roadway and, particularly, New Jersey because transportation -- public transportation is not there to accommodate the public.

How do we get the public as a mass, at large, to understand what is going on here and what all of us need to do to change to be able to protect our world?

We can't do much about global warming, but some of it is our lifestyle, the way we live and the way we're building the buildings and making them air-seal tight and all of the HVAC systems and all that stuff that we will breathe in, that is not healthy for us.

What do we as a Commission, as all of us in this room, public at large, as well, as political leaders, what do you see we need to be doing now to just raise the awareness of people at large?

This has been talked about for years and people are just not listening and we need to get their attention.

DR. BROCCOLI: In my opinion, I think the key word that you used is "leadership," that you are leaders. And as members of the Council, you are leaders of our society here in New Jersey. And there is an important role for leadership to play here because there are things that we can do about climate change.

The magnitude of the climate change in the future, how big these impacts are going to be on our society do depend on the decisions we make from now on. And so this is far from a hopeless problem, but it is a big problem. It is a big problem in the sense that the greatest effects of climate change are going to be felt in the future by succeeding generations.

And as you know, we have a lot of problems making decisions where the costs begin to be felt immediately, but the benefits, at least, the large benefits are felt in the future.

This is one of the reasons why, for example, we haven't made great headway in improving the long-term economic viability of Social Security and Medicare because these are problems that mainly affect us in the distant future, at least, we think of it as the distant future.

So there are many things we can do to raise public awareness.

What I try to do and what my colleagues who are studying climate change try to do is make our knowledge available to people to try to communicate what these impacts will be.

I'm of the feeling that almost

everybody would like to leave the world a better place than it was when they came into the world, would like to leave a better world for succeeding generations.

I think that it's mainly a question of making people understand what's happening -- enabling them to understand what's happening and to understand the connection between the decisions that we make and what our climate future is going to be.

CHAIRMAN BLANDO: Thank you, Dr. Broccoli for providing us with that very convincing and compelling evidence from the world's climate scientists on global climate change.

I would like to introduce our next speaker, Dr. Kim Knowlton from the Mailman School of Public Health at Columbia University. She is also a 2006/2007 Mellon Foundation Teaching Fellow in the Department of Environmental Sciences at Barnard College and a 2006/2007 APERG scholar for the Mid-Atlantic state section of the Air & Waste Management Association, the APERG program.

Dr. Knowlton.

DR. KNOWLTON: Thank you very much everyone for the invitation to be here today and speak to you.

Thank you Chairman Blando for that introduction.

The comments at the end of Dr. Broccoli's presentation about leadership, the question from the council member about leadership, I think the evidence is here today in this room that this council is really providing in New Jersey and the actions of various members, the kind of leadership that's really fantastic to see.

So thank you, Dr. Broccoli, for your overview, as a climate scientist. I am a public health scientist myself.

I am going to do two things. I am going to read a statement that the council members have a copy of. It includes a bunch of references to papers, reports, including the Working Group 2, IPCC report, that you referenced, Dr. Broccoli.

After I read the statement, I am going to go through a few of the slides here.

Let me begin by just offering

today my support to the efforts of the New Jersey Clean Air Council to investigate the impacts of energy efficiency and conservation on air quality and, by extension, on human and environmental health, which are my subject areas.

As a health scientist, it is important to point out that those policies which support enhanced energy efficiency and conservation measures from fossil fuel combustion will also help control greenhouse gas emissions, which has been mentioned already here today.

These measures will not only help reduce New Jersey's contribution to global warming, but will also reduce levels of other pollutants related to fossil fuel combustion that have more direct impacts on the health of New Jersey residents, including fine particles an ozone precursors. So this whole notion of what benefits efficiency and conservation can confer is really this win-win idea, as we heard said.

First of all, reducing greenhouse gas emissions. It will help curb New Jersey's contribution to global warming, as has been mentioned. The range of consequences, and Dr. Broccoli covered some of those, but I will discuss some more specific and more local public health impacts in the slides that are to follow.

My research team at Columbia University and Barnard College has been looking at health impacts that could result from global warming brought down to the local, regional level.

Our study region includes the Greater Metropolitan New York area, which includes Northern New Jersey and Central New Jersey, as well.

Our work suggests that heat stress, air quality and pollen could all become more severe problems in this region if climate continues to warm.

These are impacts that are beginning to be evident now, but will really be felt by our children and their children.

Second, and this is the point that I will show some evidence of. There are some studies that are pointing to this. Reducing greenhouse gas emissions will also help improve local air quality today and will have more immediate health benefits.

Many sources of greenhouse gases, car and truck exhaust, emissions from generating electrical power and other industrial processes are also sources of air pollutants like fine particles and chemicals that combine to form lung-damaging ozone on the roadways and neighborhoods of New Jersey.

So fuel efficiency and conservation promoting measures, such as those being discussed here today, could have these local health co- benefits for state residents both now and in the longer term, tomorrow.

Addressing climate change poses immense opportunities for positive action.

Increasing an emphasis on and support for energy efficiency and conservation would provide an incentive for local entrepreneurs to develop these alternative energy technologies and systems.

I am encouraged by the worldwide flood of interest and the state wide and local interest that is in evidence here today in efficiency, conservation and new technologies that could benefit local air quality, help strengthen the local economy and reduce overall fossil fuel use and thus global warming emissions.

It is important for New Jersey to be a leader, as was said just previously, in matters of such great local, national and global importance. The nation and indeed world will watch what happens here.

New Jersey can and should play a leadership role on this critically important issue, which will benefit the health and economic vitality of its residents.

So with that, let me see if I can advance -- yes.

It's obvious from the previous speakers' comments that indeed energy demands largely in this state are from fossil fuel sources. Fossil fuel sources provide most of the State's energy, so not only greenhouse gas emissions, but ozone precursors, particulate matter and emissions are some of the things that come from that type of energy that are cause for concern.

Climate change largely vis-a-vis health effects is going to not always create brand new health issues, certainly, infectious disease is possible and not withstanding, but mostly, it will tend to exacerbate already existing health concerns.

This is an image, remote sensing image of New York City, the northern New Jersey area, Newark, JFK. This is giving some of the -- the darker red colors are showing you the warmer areas. This was taken midday on a July day by some colleagues at Hunter College in New York.

This is to give you a flavor of something that is already part of the landscape, no pun intended, in the metropolitan region, which is the urban heat island effect.

Already urban areas and the building materials within urban areas tend to trap, capture and then re-radiate in the evening hours heat, sort of preventing the local populations from enjoying the benefits of cooling, nighttime cooling that is more typical of summertime.

So ozone noncompliance areas, the New York Metro area has been a noncompliance area. It is still a problem, an issue in the area, as are summer heat waves.

From what we can see in climate change model projections, frequency and intensity of those kinds of events will tend to increase. So that the climate changes that the models like yours, Dr. Broccoli, are suggesting will just compound already existing health impacts.

I'll talk a little bit later about potential pollen effects and how carbon dioxide and temperature can affect plant's production of pollen.

These are some images of some of the populations in New Jersey and the Metro area that tend to be most at risk for both heat stress and high ozone air episodes. Among those people, are people aged 65 and older, people with preexisting cardiovascular or respiratory illnesses, since those are the two physical systems that largely tend to be involved in thermo regulations.

Many city and state residents do

not always have the benefit of access to air conditioning. Although it's a wonderful -- a wonderful technology that we have to afford both ozone, indoor ozone diminishment and heat stress diminishment, not all people have access to that currently or in the future; so that's a point of interest that we want to consider more.

Ozone is not directly emitted from industrial -- from transportation sources, rather ozone precursors, including volatile organic compounds and nitrogen oxides, in the presence of sunlight and especially at higher temperatures combine to form ozone. This is ground-level ozone that is a powerful lung irritant and can cause lung damage, diminished lung function in a wide variety of respiratory and cardiovascular effects.

This is a graph giving a sense of -- as the temperature increases. This is for the New York, New York area. Along the horizontal axis, you see temperature increasing from left to right. And on the vertical axis, you see the way that ozone concentrations are related to temperatures.

So, indeed, on a hotter summer day, ozone production tends to increase. This is part of why high ozone episodes tend to happen in summertime months.

This is a graphic from a paper by Michelle L. Bell at Yale and her colleagues, a recent paper that took climate model projections from the 2050s under a relatively rapid greenhouse gas emissions scenario, a set of assumptions, and compared ozone concentrations mid century to those of today.

Interestingly, one of the green circles here is, in fact, Trenton, New Jersey.

This is showing that an increase in ozone levels by mid century was projected for these eastern U.S. cities.

The pattern here tends to be that many of the cities, looking at the whole east U.S. that already are experiencing high ozone concentrations are among those that are projected to experience the greatest increases, as well.

From the same paper by Dr. Bell and her colleagues, this is a projection of, again, by mid century, an increase or a change in the average number of eight-hour ozone exceedence days in the summer. It is rather busy because there are many cities involved here, but I've highlighted here, fourth up from the bottom is Trenton, New Jersey.

The blue horizontal bars are showing the number of days typical of the 1990s, the number of summer days that are eight-hour ozone exceedences.

The red horizontal bar, that portion on the right, is indicating the number of additional days projected by mid century.

Over all these cities in the eastern U.S., there is approximately a 68 percent increase in the number of eight-hour ozone exceedence days projected by mid century under this relatively rapid growth of greenhouse gas emissions scenario.

The New York Climate and Health Project is a project that I worked on at Columbia, along with collaborators that included global and regional climate modelers, atmospheric chemists, land-use modelers.

We looked at this area on the right, our study area, which, includes, as you can see, much of northern and central New Jersey. And using the global models, we tried to down scale, as it's called, going from a global, sort of broad brush stroke look into the future, and we tried to paint a more specific local picture of how heat and ozone conditions might change by mid century.

And part of what our findings suggest are this:

In the upper left, this is sort of dovetailing, again, with the previous presentation, this is an image of in the South Ferry subway station in lower Manhattan, what the combined storm surge and sea level rise by mid to late century could mean in terms of storm surge during the most -- one of the most extreme storm events.

But I will point you to the projection that by mid century, by the 2050s, summer heat-related mortality across that whole study area, the 31 county, Metropolitan

New York region could double and could more than triple by the 2080s.

Again, this is assuming a relatively high growth emissions scenario, not one of the more modest ones. And summer ozone-related mortality will increase not only within the urban core counties of New York City proper, but also into New Jersey, upstate New York and Connecticut counties, which is one of the benefits looking at a larger study area gave to this work.

In orange, this, again, is from the same study, looking by mid century and beyond, to the 2080s here, on the right, comparing in orange the projected heat-related mortality and in the darker color, the ozone-related mortality, giving you a sense of how by the latter part of the 21st century, heat-related mortality could far outweigh the ozone-related mortality, so there is sort of a change in the balance of that.

Now, I just want to hit on this notion of the co-benefits, how not only in the future, sort of looking to the mid century and the 2050s, 2080s, there could be certain health benefits, but let's look a little closer to home and to the current day.

So from particulate matter and ozone, both of which have a relationship to fossil fuel combustion and current energy demand, they have been linked to a variety of health impacts from premature death, an increase in hospital admissions, school and workdays missed. Children are at risk. Children who exercise in summer, there have been a number of studies who have tried to capture the risk among those who are exercising. And again, respiratory and heart ailments, people with those ailments tend to be among those most at risk.

This is a graph showing from a study that's perhaps unusual in that it tries to look at the cumulative health impacts between the current day, year 2000 and the year 2020, over the next 20 years; what could be the cumulative health effects, if there were greenhouse gas mitigation steps put into place.

This is from a study done by Ciquentes (ph) and his colleagues. The reference for the council members is in the written piece. But it takes over those 20 years and looks at mortality effects on the left side through hospital respiratory emissions, emergency room visits and totals those events, those deaths, hospital admissions, lost work days that could be avoided if greenhouse gas emissions were to be trimmed enough that ozone and particulate matter concentrations were diminished by 10 percent relative to the present day.

And it's quite -- some of the numbers are quite appreciable.

The vertical axis on the left is on a logarithmic scale so, for instance, looking at going from like 10,000 -- the farthest left bar is suggesting that over those 20 years, from both particulate matter and ozone that 10,000 deaths attributable to those exposures could be avoided by greenhouse gas emissions regulations.

Then moving to the right, we go through emergency room visits, somewhere between -- in the tens of thousands of emergency room visits could be avoided.

And on the farthest right bar, restricted activity days, up towards 10 million restricted activity days. This is over a New York City population, mind you, and over 20 years time. So the numbers are unusually -- or rather, atypically high from what we're used to seeing in most health studies, but consider the cumulative impacts question.

Lastly, I just want to mention something that we're looking at more closely with some support from the Air & Waste Management Association, the mid-Atlantic state section, we're looking at this more closely, the question of increased carbon dioxide and increased temperature have been found in certain field studies to enhance pollen production in ragweed, which is one of the main weed species, pollen-bearing weed species that is the cause of allergies.

Tree pollen, as well, may be affected. And we're looking at that.

It's interesting that if, indeed, enhanced carbon dioxide concentrations and temperatures tend to increase pollen production, what impact might that have on health for a local population in which asthma prevalence tends to be about twice the national average. And allergies, sort of anecdotally, you hear so many more people talking these days each spring about tree-pollen allergies so we're interested in looking at this more closely.

Some of our fieldwork so far has already found that comparing the urban counties of New York and sort of the urban core sampling site to a non-urban area, that, indeed, carbon dioxide concentrations right in the heart of the city are over a third higher than the rural sites.

The graphic here is showing some of the relationships from a paper by Baker and Brambeck in pollen quantity production on the horizontal axis and different carbon dioxide concentrations on the vertical.

We're wondering if this may be evidence of some local impact of local emissions. If, indeed, carbon dioxide emissions are prevalent and are being sus -- sustaining higher level concentrations of CO2 and if that has an impact on local plant species that bear pollen that affect allergies. This could be cause for concern for our local population.

Lastly, again, what the committee is talking about in terms of mitigation and enhanced energy efficiency and conservation is one of many mitigation efforts that are being undertaken and examined in New Jersey and elsewhere.

And, indeed, as Commissioner Jackson said, it seems like now, it's at the state level where some of the most progressive action is happening.

So I think with that, I will finish and take questions.

CHAIRMAN BLANDO: Thank you, Dr. Knowlton.

We have time for one question from the Council.

Jim.

MR. ZHANG: Thank you very much.

My name is Jim Zhang from School of Health.

In your assessment of all these

impacts, I did not see the consideration of possible infectious disease aspects.

Do you think that's a concern for this area, you know, local area, with, you know, short winter, with the hot winter days; possibly, some, you know, certain microorganisms that will not, you know, die or things?

DR. KNOWLTON: That's a great question and it certainly is a concern.

In the modeling effort that I was involved in, that was not part of our study. There are other people at Columbia, my institution and elsewhere that are specifically infectious disease specialists.

The modeling effort that is typically needed to begin to address how climate changes, precipitation, humidity changes may play into infectious disease incidents are quite complex. They involve many socioeconomic, many demographic, social factors, you know, human behavior in large part affecting people's susceptibility to infectious disease.

So it's a fantastic question and

there are a number of people who are looking at that for this area, especially, you know, some of the recent experience with West Nile, which in some quarters has been linked with weather conditions over the course of its, you know, emergence here in 1999. That's a great question, but I'm leaving that to others with that expertise to look at.

CHAIRMAN BLANDO: Thank you.

DR. KNOWLTON: You're welcome.

CHAIRMAN BLANDO: And our last speaker of the morning, I am sorry, we are running a little late, as does seem to be typical during our public hearings.

Our last speaker this morning is Lisa Jacobson, who serves as the Executive Director for the Business Council for Sustainable Energy. Ms. Jacobson has experience in the design of environmental and emissions markets and now we'll hear from her.

MS. JACOBSON: I very much appreciate the opportunity to be here, Chairman Blando.

We've had the pleasure to work with New Jersey DEP, New Jersey BPU and our former chairman was a former BPU president, Scott Weiner, he's now heading up the New Jersey School Construction Corporation.

So the Council's work, while we

are a U.S.-based, non-profit organization, we've done a lot of work in the State of New Jersey so we're very pleased to be here.

I appreciate the indulgence. I had put together some slides in the last hour since I've been here. I have prepared remarks, but I figured the format might flow better, so I know they're pulling them up.

Let me start by telling you a little bit about the Business Council For Sustainable Energy. We are an industry coalition. We are broad based. We represent generally the energy, efficiency, natural gas and renewable energy industries.

As I mentioned before, we have membership that is largely U.S., commercially focused, though, certainly, we've got companies in our membership that are global, significant exporters of U.S. manufactured products and services, as well as with North American power sector interests.

We include power developers, equipment manufacturers, independent generators, green power marketers, gas and electric utilities, as well as several of the primary trade associations in these sectors. We've got several members, not surprisingly, based in New Jersey. On the largest side, PSE&G; and, maybe on the smaller side, we have Sun Farm Network, which is participating in the solar carve out in the RPS.

Let me just advance some of these.

What I wanted to focus on today, and, again, I've made a much longer written submission available. I want to tell you a little bit about who we are and why we're here and why we received this invitation.

I want to talk about the importance of energy efficiency from our perspective, though we've certainly just heard an excellent presentation on one of the aspects of the benefits of energy efficiency, and then, obviously, review some of our recommendations for the Council.

I mentioned our general makeup so I'm going to advance here.

Here is just a sampling of some of our members. We've got energy efficiency product, manufacturers, developers, as I mentioned, some of the gas and electric utilities in our membership, some of the industry organizations we represent. Important for today is the Alliance to Save Energy, as well as some of the large associations for the insulation manufacturers industry.

You will see up here some of the companies that we represent in the northwest.

The Council's mission is to expand markets for clean energy products and services and to support new vehicles to expand these markets through the integration of energy and air and climate change policy.

Being here today is a perfect fit for us because we were formed to be a strategic mid market for our industries and to support the recognition and the quantification of the environmental benefits of investments in clean energy technologies generally.

So what do we do?

We promote markets and we promote

clean energy technology solutions. We work across, you know, various local, state, regional, federal and international levels to shape the design of clean air programs and climate change markets. Our niche really has been in the incorporation of a broad set of clean energy technologies into market-based programs.

So let me start with some of my general comments.

First, again, right in the beginning of your brochure you talk about the importance of integrating energy and air quality policies, which the Council thinks that's essential.

One of our policy papers out is Climate is Energy Policy, but I don't think we should get too distracted on the climate side because I think just from an air-quality perspective, looking at incorporating energy efficiency is, you know, a clear direction that you should take.

The presentation that preceded me just on some of the health impacts alone I think set the stage in terms of what can we do to accelerate energy efficiency, what do we currently have that we can improve and expand upon and what new vehicles might there be.

The reason we believe it is so

essential to do this from a public policy perspective is that there are limited resources to invest in both energy and environmental protection policies, so we need to maximize that and we need to have integration across government; that kind of governmental efficiency is extremely important when we're trying to tackle these complex issues with significant economic impacts.

Similarly, we would encourage you, when you look at particular programs to view them in a holistic fashion. There has been a lot of discussion about market-based programs. And we are a very significant proponent of them. And I will get into the reasons why in a moment.

When you're looking at things like energy efficiency, which happen, you know, pretty much across the scope of activities in the power sector, for example, you know, at a home residential level and at a very large infrastructure basis, it's going to require some significant policy tools to make sure that you are actually integrating energy efficiency into a market-based program.

And then, the next comment, yes, they're very powerful and we believe that they're, you know, a preferred method to address clean air and climate change, but they're not going to address all the special circumstances for energy efficiency so you're going to need complementary policies to move forward, as well.

Don't overlook the importance of public awareness. I mean, we certainly see this in the energy efficiency industry. The Council focus on energy efficiency and air quality and everything that the State leadership is doing to promote energy efficiency is going to penetrate consumers, but we need a tremendous amount more to be done. We support you in that and look for opportunities to help you with your public awareness issues.

In the written statement I provided, the main areas of focus are the value and benefits of integrating air quality and energy programs, the societal and economic efficiencies of market-based approaches and, specifically, how do you incorporate energy efficiency and clean generation into market-based programs.

As a coalition that represents more than just the efficiency industry, when we look at clean technologies, I put in some suggestions of other technology areas, but New Jersey is well on their way to recognizing the value of things like renewable energy and combined heat and power. I think Mike Winka's presentation covered breadth of the activity that you have already underway.

I am sorry. I am having a little difficulty with this, but eventually, it will come.

In terms of the importance of energy efficiency, and I've been here probably for the last five presentations, and this may have been covered before, but from our standpoint, energy efficiency is the quickest, the cheapest and the cleanest way to meet growth and energy demand and to reduce air quality and climate change emissions.

I think it's very important to kind of keep that in focus. I put some stats up here. This is a national stat. You know, buildings account for 40 percent of total U.S. carbon emissions per year and energy efficiency can make a significant impact in reducing emissions.

I am going to pull up a few of the stats here that I think are important to note. And again, it draws to the reason of why you need to integrate environmental and energy policies because there are, you know, multiple benefits and co-benefits of energy efficiency. And if you're not looking at them in an integrated fashion, you may loose this and you may not focus as much on energy efficiency.

So for energy efficiency programs, they could save half of the typical costs of the new power sources and a third of the costs of natural gas.

This is significant as transmission was already raised in Mike's presentation. It's extremely expensive to site and build transmission lines and there is certainly a lot we can do on demand production. And, you know, any conversation you have on air quality and climate change with the utility sector, both electric and natural gas utilities, you're going to get into a discussion about price and cost and what are we doing to that. There is a big concern about increasing cost for natural gas.

The ability to utilize and tap into energy efficiency will be key in addressing that.

And then for every federal dollar spent on Energy Star, you know, they have -- you know, again, the return on these investments is very significant and should not be lost.

So clearly the environmental benefits of energy efficiency should be recognized, should be rewarded and should be incentivized I would argue under air quality and energy efficiency programs.

As I mentioned, there is a relationship between energy efficiency, air quality and climate change, as we've already discussed.

I believe that there is growing support for the view that it is lowest cost and easiest options that we need to address. One of the easiest options is to address emissions and supply and demand side efficiency options are still untapped.

It's challenging to do this. It's not straightforward. Many discussions we have on RGGI, for example, in the northeast or the Clean Air Interstate Rule, you know, just by doing this alone, setting up a cap and then allowing trading, all of a sudden we are going to get benefits in deployment. Well, for energy efficiency, it has got some unique features and we need to look at those when designing such a program.

I put a little quote up here.

Energy efficiency loves cap and trade, but cap and trade does not always reward energy efficiency.

It's crucial that the program design be set in a way that directly rewards energy efficiency. Some of the windows to do that are through out-patient policy, set asides and offsets.

I will get into some of those issues in a little bit.

Again, there is this feeling, and it certainly is the same with renewable energy, that if we do a market-based program for air quality or climate change, there is going to be a big increase in deployment of clean energy technologies.

And, again, renewables and efficiency and other technologies have their own specific issues, but if they're not addressed directly in the program, the indirect benefits are not going to be that significant.

Emissions programs clearly make energy efficiency more attractive. And, in particular, it's just because we're talking about it right now, any time we talk about energy efficiency, you know, you're getting more consumers aware of the opportunity that's presented to them. So public awareness is clearly going to happen.

Over time, as deployment happens, we're hoping that costs go down. We certainly have seen that in market segments. And then there is the opportunity to create new financial vehicles. I will get to energy resource standards in a little bit, but I thought Mike Winka did an excellent job of explaining how that type of financial model could work very well for energy efficiency and help keep the benefits in New Jersey and spread that through the New Jersey economy, which I think is another crucial aspect of market-based programs.

And then emissions -- the tension on emissions issues can drive other policy changes. They can increase building code standards, create beyond code programs. They can address appliance standards. And they can expand consumer rebates and bring up new ideas like this energy efficiency resource standard.

Again, the Council is a proponent of market-based approaches. Market-based approaches aren't just cap and trade. They are things such as the renewable portfolio standard that allows for credit trading, things like the energy efficiency resource standard model.

There are things that New Jersey

is very experienced with, like their NOx trading program and some of the new initiatives that are underway like the Regional Greenhouse Gas Initiative.

No. 1, you know, we believe it's important because the market-based incentives can lower the cost of compliance. When you're looking at climate change, you have a global potential pool of participants. When you're looking at air quality, you're looking more in a local context, but still you're giving people the option to go for the lowest-cost investment that will achieve the desired results that you want. And we believe they also create over-performance incentives and that's what drives new technology.

And as I mentioned before, incorporating energy efficiency into market-based programs has some challenges, but these challenges are not insurmountable and things like the RGGI program have shown some good directions on how you might do it.

Supply-side efficiency can be addressed through emissions allocation policies. So under a cap and trade program, you're going to limit the number of emissions across a sector, let's say, it's just the power sector, for example, and then you're going to distribute emissions allowances on a pro-rata basis or on a historic basis in terms of their emissions or, as we would argue, on their generation output.

If you do that, if you distribute allowances based on their generation output, you're building in a clear driver for energy efficiency. And so individual facilities, utilities are able to make decisions in their planning process that will value energy efficiency because it will get wrapped up into their annual emissions and they will need less allowances to generate the same amount of power.

We believe that this is a very important concept to understand. It is a little difficult to explain so please ask me questions about it.

It also gives you an opportunity, again, to value megawatts or energy that is avoided. So again, this is a powerful signal on a large scale to the power sector.

Sometimes, though, depending on how a program is structured, like, for example, under the Regional Greenhouse Gas Initiative, RGGI, they set a threshold of facilities that are covered at 25 megawatts. Well, some of the new clean power that is coming on line, while it's still vital is smaller than that so we have to come up with tools to bring that power into the allocation process so they also receive those signals and the financial value of more efficient generation is rewarded.

So I mention here, for example, Set aside programs that might address small clean generators, maybe 20 megawatts, either combined heat and power or renewables.

The next slide talks about demand-side management and the challenges that they pose.

Again, these challenges aren't insurmountable. We just have to understand and look for ways to give those spending the resources the most direct incentive for energy efficiency.

One way to do this is through

either a set-aside policy or auction revenue under a cap and trade program. For example, the Regional Greenhouse Gas Initiative under New Jersey's plan are looking at auctioning off a significant, if not the entire portion of the emissions allowances and using that money primarily to support energy efficiency investments, either the programs that Mike mentioned or other, new financial tools.

Another way to do this is through an offset regime. Right now, we have a growing greenhouse gas voluntary trading market emerging where very large retail companies or large energy users are, on a voluntary basis, saying we either want to say to our customers or to the community itself that we value clean energy and we're going to make a commitment to 25 percent of our energy coming from renewable energy sources or we're going to offset 25 percent of our energy use and reduce our greenhouse gas emissions and they're going to buy products in the financial market that offer those benefits; that's another way of thinking of offsets.

The challenge for energy

efficiency qualifying under that is that there is an aggregation need.

A lot of the energy efficiency improvements that we're trying to target happen at a level where it will be challenging to aggregate. It's been done. There are models out there, but it is just something to be aware of.

And then there is a growing interest in having standardized criteria for monitoring and verification of energy efficiency offsets. And there is, also, an interest in some camps of having them prove that they have happened, but for either -- but for the market-based activity. Either they are happening because somebody wants to purchase them for a voluntary offset or they're happening in addition to whatever regulatory requirements might be there and that's often termed "efficienality."

From the Council's perspective, we think the integrity of any offset is essential, but for energy efficiency investments that are not happening in the marketplace today, we don't think you need a very high "efficienality" test. We think we want to just find ways to get as much of this done as possible.

The last couple of slides are

going to talk about some of the complementary energy policies I mentioned in the submission.

One thing the Council -- these are recommendations that you could make to DEP in terms of policies in addition to incorporating clean energy into market-based programs.

No. 1 is decoupling. There is significant and growing interest in many states on decoupling; that is, delinking profits from sales of energy and natural gas.

And the second, again, is this energy efficiency resource standard concept. We like the concept of making it separate to the RPS, either a separate tier or a separate program in and of itself. We don't want to see the renewable energy target diluted and New Jersey already has one of the strongest New Jersey RPS targets in the country so we applaud New Jersey for that.

We also think there should be a consistent time frame with the RPS. Again, you're trying to incentivize market change and long term market signals work best for technology deployment.

And then we encourage you to look

at code and beyond code programs because, you know, there is a quote that one of my members told me last week about energy efficiency. There is -- Sir Nicholas Stern, who is a prominent economist out of the United Kingdom came out with a very large economic impact study on climate change late last year and it got a lot of attention. Some people didn't like the assumptions.

Nevertheless, it was a very significant and comprehensive study. He found that there would be no economic harm to addressing climate change globally. It would have, I think a 1 percent on GEP.

Again, whether you agree with that or not, when asked at a speech at Berkeley last week by a student in a very large audience, you know, what are the two things that you could do as an individual to address climate change, he said, Eat less red meat and insulate your home.

So I think looking at code programs and anything you can be doing there is essential and we're happy to work with you to do that.

I would say finally, that we've submitted, as an organization, some fairly extensive comments to New Jersey on the Regional Greenhouse Gas Initiative both in terms of its allocation policy decisions and on what it might do with its public benefit set aside.

In particular, what we were trying to do was to say to New Jersey, Look, should you decide to use your public benefit allocation resources for energy efficiency and renewable energy among other clean generation options, looking at your current programs and what your energy objectives are -- now, of course, this was late last year so things are going to be changing a little bit, but I think the general direction will be the same -- here is a critique of your programs and some models that you may want to consider.

So, again very state specific and market specific recommendations and critiques of your existing programs, which across the board, I think New Jersey is doing an excellent job. And so we, again, really appreciate your leadership and the opportunity to talk with you today.

CHAIRMAN BLANDO: Thank you.

MR. THOMAN: Hi, I'm Ken Thoman.

I don't know if you can answer this question or not, but I'll try.

Do you know why there is such a difference of opinion with regards to the allowance allocations within the participating states of the RGGI program?

MS. JACOBSON: Well, that's interesting. I thought you were going to go in a different direction, but you are saying between the different --

MR. THOMAN: That might be my second question.

MS. JACOBSON: You know, again, I see it mostly from the industry perspective where there is a very different set of opinions about how allocation policy should be done.

From a state basis, I think the

No. 1 thing the states are looking at -- and to just kind of remove myself from the business council for a moment.

Some states are very concerned

about leakage, which can direct them -- put them in a different direction perhaps for allocation policy.

Some states may be looking for the broader political agreement and how we can bring in the covered sources in a more agreeable way perhaps, which might lead them to some allocation decisions.

Others may be more in tune to kind of the environmental and consumer and stakeholder interests that have focused very heavily on auctions.

None of these are completely exclusive, but I think that could be why you're seeing differences of opinions in states; but, actually, what we're seeing is a very strong trend towards large auctions, which didn't exist six months ago.

New Jersey and Jeanne Fox, in particular, was one of the first commissioners to say, you know, we should be doing very large auctions. We need to find energy efficiency, if we are going to meet our RGGI targets. So she was a real leader in that direction.

And if you ask me today, it certainly is not over because there is a lot of pushback from generators on significant auctions, especially in the beginning of the program; but today, there are many more states and significantly the largest states participating in RGGI are looking at very large auctions.

Did you mean auction versus allocation or did you mean how you allocate if choose to do free allowance allocations because they are kind of different questions?

MR. THOMAN: I guess from our perspective, it was: If I look at the way the NOx credits were handled, where they allocated them to the companies that were, let's say, producing and then they used a portion and then they allowed the auction to go, thereby, you know, generating some revenue for renewables and things of that nature.

And I guess from everything that

I've read on it, it was viewed as being successful, and then we come to the RGGI issue.

I guess what I'm seeing or reading

is that even though that was viewed as being successful, they're looking at something significantly different; that being, possibly offshoots upwards of -- I believe, New York came out in 71, it would do 100 percent without allocating any to the generators.

And I was just wondering why the states that got together and participated in the RGGI program, the fact that they were altogether working on this, I would have, I guess, assumed or thought that during that process, they would have had a consensus on how they would like to have implemented it.

I guess from my perspective, what you see is the states agreeing on the concept of RGGI and then leaving the table and deciding to do it different ways.

And then the other issue with that, obviously, is how the product is dispatched to, you know, your power points, our state being through PJM interconnection and, I guess, in New York it is through an ISO (ph), so I think those other issues come into play, as well.

MS. JACOBSON: Well, this requires

a very lengthy response, which I wouldn't do justice to you in answering it quickly. I would very much welcome the opportunity to talk to you about it.

I think, you know, allocation is the financial part of the program and under RGGI, the Commissioners, you know, wanted to hold that for themselves, even though they may have had common areas of agreement across states of what they might do on a state level for allocation, it was not something that they wanted to have this regional agreement address because it's commercially so important to them and to their state economy so I think that's why you didn't see that position.

When you look at, you know, the federal bills in Congress, allocation is the heart of the program. You're really setting the stage for the energy sector for many years ahead; that's why we even encourage you to level the playing field and do alpha-based allocations because we think that the efficiency drivers through the power sector, and, also, makes it a level playing field for some of the emerging clean technologies like renewables.

MR. THOMAN: And I think the level playing field is a very important issue.

On top of the environmental issues, it really now becomes even more important for a federal standard because not only do you have some states willing to participate and others not -- and it is, it is a global issue, it's not a state issue -- but it further begs the, you know, the question or the need for a federal program now more so than ever because you get to the implementation stage and there is going to be differences there, as well.

MS. JACOBSON: Definitely. And again, we wholeheartedly agree we need a federal approach, but I wouldn't -- I would only want to say how important RGGI has been in terms of keeping this on the agenda and making the case that, Look, states can come together and address these difficult and challenging issues, even if just for the power sector.

So, you know, it's not perfect by any means. There are things we would like to see improved or we would like to see a transition toward a federal program; but, you know, for now, we are very interested in the precedence that RGGI is setting. We will have to see how quickly things move in the Congress.

The things that we are talking about with you today are consistent with the things we talk about with members of Congress. Our position doesn't change if you look at them at the state level or if you look at them at the global level.

We think energy efficiency, in particular, needs to be directly incorporated into these market-based programs, not just we will hope that they get indirect benefits down the line, but we need them to lower the cost of compliance. We need them for the energy challenges we face and we need them for the health benefits they give and the list goes on.

There should be no question about moving forward with energy efficiency for whatever justification you want to give us.

MR. THOMAN: Thank you.

MS. JACOBSON: Yes.

CHAIRMAN BLANDO: John.

MR. ELSTON: My name is John Elston.

I enjoyed your talk very much, Lisa, particularly on the holistic look on what we have to do as far as efficiencies go and some of the market-based approaches -- and I don't mean to misrepresent your words -- do not necessarily reward new technologies or efficiencies. There are trade-offs often.

I want to ask you a question.

We've heard from our previous speakers, the dire urgency of this problem. In part of your testimony, you mentioned public awareness is needed and we all say that.

And I'm wondering, what kind of -- how can we jump on something that works for public awareness and not cost the oil industry and other industries in the billions of dollars.

The only one I can really conceive that seems to be working is the anti-cigarette campaign that has gone on in the last ten years in this country.

I was wondering if the Business Council could in some way find the resources with the government's help in order to bring about the fast resources necessary to conquer what is a dire situation perhaps in the next 10 years in this country and this world.

MS. JACOBSON: Well, mostly, I think, one of our -- on energy efficiency, the Alliance to Save Energy is a very good example of -- you know, their a non-profit organization, we're an industry trade organization, so we are a little different than the Alliance to Save Energy, but they have worked with the Department of Energy at a federal basis and EPA on a burgeoning energy efficiency campaign.

If we had this conversation five or six years ago, our energy policy, would have been, may not in New Jersey, but federally would have been, you know, cheap energy on demand.

Getting people to think about energy efficiency five plus years ago was very challenging, as you may have found in your own experience and it still is. I mean, it's a very irrational marketplace.

So I think models like the campaign, PR effort or I am trying to think of some other ones, right now, I am blanking, but there are many. All those kinds of campaigns are really needed.

We need to take a Hill Knowlton approach with it. We need to spend the money and we need to get the people in the places where they are -- you know, on TV, on buses, public service announcements just telling them that energy efficiency -- in a positive way, not the "put on a sweater," but the benefits they're going to get for their household from energy efficiency and telling them over and over again the return on energy efficiency investment and the short time period for pay back and then creating the support on a governmental and private sector level to leverage that interest.

I mean, still right now, okay, you can say it's a three or four year payback. You can say you have got to put up significant -- you know, $200 more when you buy that appliance; that still changes decisions at the retail level. I mean, even though if you look at it, you have all the facts and figures, you are still --

MR. ELSTON: You're mentioning positive solicitation or campaigns to the public, in a positive way.

MS. JACOBSON: Yes.

MR. ELSTON: The cigarette smoking ads were very negative and succeeded: You're going to die of cancer.

If you're going to have all of those aspects, why not look at it that way, as well, why not bring up the dire situation?

If we believe what the scientists tell us, we have a dire situation in front of us so we ought to be telling people that he we have the dire situation.

MS. JACOBSON: There is certainly the threat and opportunity strategy. I think some of the environmental groups funded by the

Energy Foundation have started to do them. I have seen them in the D.C. area. But they are doing very compelling kind of threat-type ads related to climate change from, you know, a species basis, from a human health basis, from floods; that's probably not the approach the Business Council would take as an industry trade association.

Certainly, I can put you in touch with very good people that you could explore that with. Anything that New Jersey could be doing I think is extremely helpful.

CHAIRMAN BLANDO: I guess, just a final question because it's lunchtime and I am sure everybody is hungry.

Jim Blando.

I know one problem that I have had talking to some more progressive companies that are very interested in energy efficiency is when they look at their manufacturing facilities, for example, I've had multiple comments, and more often from managers of these plants, they tell me that the return on investment for energy efficiency projects is too long for their quarterly returns.

I often feel stumped about how to argue sort of the business side because they're looking at it and seeing the quarterly statements or whatever it is that business people look at.

And I'm just -- would a recommendation be for those folks that other -- I mean, is there another way to incentivize it, not using government resources to do it?

I mean, the cap and trade is, obviously, one approach you mentioned, although I have to admit I'm not fully aware of all the other issues, but I am wondering if there is anything else you could suggest.

MS. JACOBSON: There is the energy service industry, where, basically, there is a -- it's called the ESCO (ph), Energy Service Company.

We also on the federal government side, state governments do this, as well, run a coalition that's focused on federal performance contracting so, basically, the concept is there is an energy service industry that would go to that facility and it would,

you know, either arrange a power purchase
agreement with them, as well as an energy
audit and, say, These are the energy savings
you can expect over the five years of our

relationship together. This is the upfront capital costs that we envision it costing and we're going to take on -- this is a very simplistic way of explaining it -- We're going to take on that risk, we're going to pay for those capital improvements and we're going to give you right now an agreement that will tell you what your power prices are going to be over the next five years, as a term that we've agreed to. And because energy efficiency -- and it's very transparent, you know. The challenge is these people don't have the capital and it's not in their operating budget and they can't justify, even if it's a two or three year payback, making that expenditure.

So here is an industry that can support that time frame and take on that risk and specialize in this area. And this is a growing industry. And, again, you know, it happens in a governmental procurement contract and it happens in the private sector.

So I'm happy to get you more information on this. There are, you know, national associations of this sector called, NASEO, and other energy service company organizations that I can put you in touch with happily. I know that there is a lot of activity in this area here in New Jersey.

MR. WINKA: But that's where setting a portfolio standard or a resource standard helps. You say, This is the amount of resource from energy efficiency that I want. I have to procure that. I can procure that from an ESCO (ph). I can procure that using a utility. Ralph Izzo calls it patient capital, you know, they have a return on investment that is 3 or 4 percent. If you get an energy efficiency project that gives you a 12 percent return on investment, that's better than 3 and 4 percent and not the 16, 20 percent. So that's the marrying of sort of, Here is the requirement on the RPS side.

How do you do that?

You deliver that through those services through the ESCO (ph).

And in the energy portfolio

standard, you're not talking about just
changing lights, you're talking about just
like Lisa said, a whole building energy
upgrade that you measure and you define what

those energy savings are. So there are ways of matching up those programs.

CHAIRMAN BLANDO: Okay.

Thank you very much.

We're going to break for lunch. I see we're running a little bit late. I would just to note, there is a cafeteria on the first floor, if you would like to get something at the cafeteria, just walk across.

All Council Members and invited speakers are welcome to come up to the seventh floor conference room for lunch that will be provided.

I guess we're running a little bit late. Hopefully, the speakers that we have on schedule won't mind a 15-minute delay. Perhaps we can get back to the public hearing room at 1:00. Eat quickly and get back to the public hearing room at 1:00 so we're not too terribly delayed.

(Luncheon recess: 12:39 p.m. to

1:13 p.m.)

A F T E R N O O N   S E S S I O N

1:13 p.m.

CHAIRMAN BLANDO: I think we're about ready to get started again if all of the council members who are in the room could work their way to the front of the room so we could try to get back on schedule.

Our next speaker, John Rhodes has graciously agreed to condense his presentation into 15 minutes, which will be a bit of a challenge, but for the council members we have copies of his full presentation and he's agreed that if we have any questions, we should feel free to shoot him an e-mail if we have any questions about anything.

Also, Dr. Felder from the Bloustein School graciously has agreed to speak a little bit later, as well. So we will be able to jockey some schedules around to hopefully accommodate a few of our speakers who have train tickets that they have, so that they can get back to the train and get back to D.C.

So without further delay, John Rhodes, who was recently appointed by

Governor Corzine as New Jersey's first Director of Energy Savings in the Department of Treasury in compliance with Executive Orders 11 and 54, who's objective is to increase energy efficiency, reduce energy consumption and costs and reduce greenhouse gas emissions in state government. He is a certified energy manager with 18 years of experience specializing in energy supply and management, having held positions in the regulated and competitive and end-user sectors.

John.

MR. RHODES: Thank you very much and good afternoon.

I will try to keep this brisk and try to condense this into 15 minutes. Hopefully, we can make that happen. If it becomes too compressed and you need to reach out to me, please do so via e-mail after today's meeting.

I think you probably have a very good sense after this morning's speakers about the energy problem situation that we have.

I'm not going to go through each

of these, but I think we can all agree that these are some pretty serious issues that we're facing. It will have an impact on our environment, on the economy and on national security.

As I see it, the air quality connection, as it relates to energy, is kind of broken up into two areas.

One is an area where there is a direct and obvious impact, where most folks readily acknowledge the connection between energy consumption and the environment and air quality.

Motor vehicles are a perfect example. It's very clear. People can see the exhaust, they can smell it and have a pretty good idea that it is probably not a good thing for the environment.

Electricity on the other hand is a little bit more insidious where the ultimate end user is disconnected from the generation source and, also, from the unsightly pollution. It's just very easy to flick a light switch or plug something in without thinking too much about the impact it's having on the environment.

I wanted to look at terms of carbon intensity. This is just basically an illustration, looking at pounds of CO2 emitted per million of BTUs of energy consumed.

You can see the different energy types here and see that electricity is far and above the others in terms of kickback on greenhouse gas emissions and so forth.

You might easily point out, Well, wait a minute, aren't these other fuels used to generate power?

Well, they are, but you have the inherent inefficiencies of electricity generation and distribution, which further contribute to that differential.

Electricity is certainly a primary target for improvement.

I think, again, we can all recognize what energy conservation and energy efficiency can deliver to us. It can reduce these things. It can put downward pressure on the prices. I mean, it's all good. The problem is, it's not all easy. And in a practical sense, we have -- we really have to think hard about how we're going to make this happen.

So we all get it.

So what do we do?

I want to throw a couple of illustrations up here about how we need to change our thinking, our philosophies, our actions. I think these are some good illustrations.

I mean, think about our personal lives. As we walk away from policy and our jobs from the day, we go home and we have a cell phone plugged in to charge or a game for a child that has to be charged; do we really think twice about plugging that thing in? And if most of us look under our computer desks, we will probably see something that looks like that extension, fully loaded.

Of course, the vehicles we choose all make a powerful statement about what our true beliefs are.

I think overall we're a very wasteful society. We don't think twice about consuming and throwing away without really paying a lot of attention to recycling those products. I think the recycling effort itself could save up to 30 percent in energy consumption related to that product's manufacturing.

And, again, the light switch. I mean, flipping the light switch and just realizing that somewhere, not too far away probably there is going to be a direct environmental impact related to that electricity use.

This last one, I just want to kind of illustrate that we're all very busy. We've got a lot of priorities and deadlines. It's very easy to push off something like energy efficiency and consumption. We have to work hard to keep it in our minds everyday.

I want to talk a little bit about what New Jersey is doing. I've been in this role for four months now and I'm learning a great deal everyday. I come from a pretty diverse amount of experience. My last two positions were managing energy programs for large corporations. And in a way, the State of New Jersey or New Jersey Government can be seen as a large corporation, a very diverse company with many divisions, many different viewpoints and objectives and throw a healthy dose of politics in there just to make it interesting.

I think Governor Corzine has made it clear with his commitment with Executive Orders 11 and 54 to reduce energy consumption, increase efficiency and reduce emissions for all state facilities and that's where I come in. I started in December and established the Office of Energy Savings within the Department of Treasury.

As of next week, I'll have three members on staff. We're a pretty lean organization and I'm proud of where we're heading and what we've already accomplished today, which I'm going to expand on a little bit.

Here is a quick overview of state government. Don't hold me to these numbers because I'm still trying to figure things out, but we consume over 8 trillion BTUs every year throughout all state departments and all agencies. We receive quite close to 30,000 invoices a year for energy. I don't think we're doing a good job today for evaluating those invoices and extracting useful information to really manage our use and our costs.

There are a lot of employees out there. As far as I am concerned, every employee is an energy consumer and every one has to be thinking the right way in terms of what they're shutting on and off and how they're operating equipment and so forth.

There are over 4,000 buildings, although there are about 300 facilities. Some of these are large campuses with many buildings, so there are a lot of different things to look at.

We've got over 12,000 vehicles out there and that's sedans and heavier equipment; that's quite a challenge.

Here is the emission profile.

If we look at that 8 plus trillion BTU a year consumption, here is how it breaks down. So most of it is attributed to our facilities.

Again, this is kind of a quiet emitter. We don't think of these nice, clean office buildings, well, at least, in most cases, as being dirty; and that's really what it comes out to be. 84 percent of our CO_2 emissions are related to facility energy consumption and it's naturally going to be a big part of our program.

The management strategy I'm utilizing isn't all that innovative. This is based on an Energy Star, best practices approach that's been proven. And it's one I've used before with great success. I think it makes a lot of sense logically.

The first step has already been accomplished by the Governor. It's an extremely important step in terms of making the commitment.

Now, we're at the phase where we really need to analyze the data to see just how we're consuming energy, how we're using it, how we're misusing it, ranking the facilities, benchmarking that performance against other facilities outside the State, using programs like the Energy Star and Portfolio Manager and coming up with specific plans for each agency.

And then, it's a continuous process, a continuous fight to monitor and to improve track performance. We also have to reward accomplishment and then go back and do it again; but, ultimately, there have got to be measurable results.

I just want to talk about some of the initiatives on the way. The evaluation piece, I've covered. We're in the process of forming department energy teams; that will include members of my staff, as well as the large energy-using departments in the State. For New Jersey, that happens to be the Department of Human Services, Department of Corrections and, also, the Treasury Department, who manages most of the buildings in Trenton. So right there are the big three that are getting a lot of attention.

We're taking immediate steps with energy conservation initiatives. I will talk about that in a second. We're evaluating potential projects, energy efficiency projects and ranking those based on impact in terms of environmental impact and cost estimate.

We're reviewing the State vehicle

fleet, so those 4,000 plus vehicles. We are trying to find out what kind of vehicles do we have in place today, what is our procurement policy for buying vehicles and what can we do to improve those, what kind of phased-in approach can we use to ensure that we're reaching the targets we need to hit in terms of fuel efficiency and greenhouse gas reductions.

We're also working with the information technology folks, looking at ways to shutdown desktop computers automatically. You can imagine with 80,000 employees, that's quite a few desktop computers that are running. The fact is today they're not all being shut off at night; that's a lot of energy consumption that is not necessary. There are some programs that will allow us to shut those down in an automated fashion from a central standpoint.

The other things are we have a lot

of redundant office equipment out there, printers, faxes, copiers. Today, one machine can do it all, so you don't really need to have that duplicate capacity.

The other gray area is just duplex printing where, you know, most folks still print on one side of the paper. And it's just -- I mean, you could chop your paper consumption in half if you just switched to duplex. It's a pretty common concept here.

The recycling program, I think is in great need of evaluation and kind of a kick start. I am bringing someone in new next week to manage that for us for the State of New Jersey. They're going to be working very closely with representatives from each state agency to see what we're doing today and what we need to do to improve the recycling rate for all the agencies.

We are also working on proposed legislation which will allow for performance contract procurement. The State of New Jersey currently has procurement restrictions, which preclude us from using performance contracting as a tool for financing energy efficiency projects. Most other states, I believe, are able to do this and this is a concept that's been around for quite awhile.

Basically, it would enable us to

finance so we don't have to use our capital or lack of capital, I should say, and we finance it over the term and fund it out of energy savings, out of the utility fund. And we're not incurring debt in doing this.

We're also working on a website in my office, which we'll provide as a clearinghouse of information for all the State agencies about what they need to be doing, to keep things foremost in their minds.

Here is some of the stuff I wanted to get to. This is right in downtown Trenton.

What is wrong with that picture?

Anybody?

THE PUBLIC: All the lights are on.

MR. EGENTON: I see that every night when I drive home.

MR. RHODES: It's amazing. My first week on the job, there was quite a bit of discussion about this. The building on the

left is the Labor building and I know the
Governor saw it, you know, every evening.

MR. EGENTON: You can't tell me
there are cleaning people on every floor.

MR. RHODES: That's exactly what we dug into.

MR. ZONIS: There are workers up there.

MR. EGENTON: Are you kidding?

This place is a ghost town after 5:00.

MR. RHODES: When I found out about this, I asked a few folks about it and the responses were, Well, you know, there are constraints with the building controls, plus there are cleaning crews, we can't do it, it's not feasible.

So I contacted the Commissioner of Labor and that night we ended up there with a bunch of folks, we got technicians there and hammered it out and figured out what needed to be done. We ultimately came up with a plan to cut back -- to basically shutdown the lighting much earlier than it normally was. Originally, it was about 11:00, it was being shutdown. We were able to move that up to 6:00 or 6:30 now.

They had to shift some cleaning crews around. They had to come up with a contingency plan to just leave a certain quadrant on; but certainly, it's a lot better than leaving the entire building lit up like this.

So these are fairly easy to implement. There is a lot of energy consumption there. It is 13 floors. It really doesn't cost anything to change the building controls, to change the time clocks just to use less.

We're really proud of what we accomplished so far and working with the Division of Property Management Construction, DPMC, we've made a lot of these adjustments. I think there are about 36 buildings roughly in Trenton. We've reviewed and adjusted nine of them. This is the impact of just nine.

Keep in mind, this is, basically, a no-cost initiative, no capital and we're reducing consumption by 3.5 million kilowatt hours annually, you can see the air emission impact and, guess what, we are saving some money, too. I like that.

So overall, for conservation, raising awareness is a big thing; that's going to take continuous communication. It's got to be personal. I mean, we're talking about 80,000 state employees who have got to feel that they have a personal stake in this; that's going to be a bit of a challenge. They need education about the linkage between energy use and the environment. And -- do you know what? -- they need to also understand that there are things they can do at work, while they are at the state office and there are also things that they can bring home. Basically, that's going to be a good thing for the State overall.

The agencies can't hide anymore. I mean, they have large budgets. Energy is a piece of that. It's not the largest piece, but we're making it important.

Basically, my office is going to be gathering the data and doing the reporting so this is going to be very visible and it's going to become very important for every agency.

Some of the quick opportunities, I don't know how much time you want me to spend on this, but lighting retrofits remain as one of the most cost-effective opportunities out there.

There are some other things on the board. I mean, chillers. The State has some chiller equipment. You're not going to see too many tours that look at something like that, but it happens to be a tremendous opportunity. If you look at a 25-year old chiller, if you put something new in, you can double your efficiency; that's a great opportunity.

Even with lighting, there are buildings right in Trenton that are still using old 212 lighting technology; so that's a 30 to 40 percent improvement we can see just by going to 280. This stuff is -- you know, there is potential here. I'm excited about it.

Combined heat and power, fuel switching, moving away from some of the fuel oil we are using in some of the remote facilities where there is not, you know, gas supply currently and renewable technologies, taking a hard look at that and evaluating the cost effectiveness.

Energy waste, I'm not going to spend time on this. Again, a lot of this is common sense about what we have to stop doing.

Solar power, I just want to point out a couple of the existing installations. We have a system running at Fort Dix. It's 181 kW and that's been up and running since June of '05. And there are two other installations ready to be energized, one at the homeland security building and one at the new state police, emergency operations center.

I mean, just to get a little perspective, this is some of the impact from the Fort Dix installation, so definitely a clean source.

I want to point out, this isn't technically an energy efficiency initiative, but it is certainly a clean initiative. And it really has an impact on air quality. So I just wanted to point out what is going on in the State.

Again, this is getting back to the lighting example. And this happens to be a real building in downtown Trenton where we could go from the 212 to 280 technology and see a substantial reduction in our electricity consumption. And you can see the environmental impact and the cost reduction.

The other little benefit is it will be a better working environment. It happens to be a horrendous office where the lighting is extremely poor.

We all want our state employees to be very productive, right?

Just a quick fast forward.

The measurement system is extremely critical. Just from my past experience, if you don't have, let's say, a credible and an accurate measurement system, the yardstick you use for all participants is simply not going to get the results you need.

We don't have that today and I'm working hard to put that in place. There are some real obstacles. Things are complicated the way bills are processed. And there is just a lot to it, but I'm confident we're going to get there.

The benchmarking, again, so we're not just going to look within the State facilities. We're going to look outside the

State at the rest of the country. Each department is going to have a goal so they're going to have a real interest in seeing some improvement.

Again, raising visibility and accountability I think is just one of the most important things.

So, folks, we really need to do the right thing. We need to drive continuous improvement, so it's not going to stop. It's going to be a constant fight to keep it fresh in people's minds. And to keep seeing the improvement, we're going to need to hit the long-term objectives.

That's it.

How did I do on the time?

CHAIRMAN BLANDO: Very good.

MR. EGENTON: Can I ask a quick question?

CHAIRMAN BLANDO: Sure, please.

Michael.

MR. EGENTON: John, that was a great presentation.

Michael Egenton.

It's the whole concept of lead by

example. I commend you and the Governor for looking at this because, as I said, I drive home at night and I often wonder why are all those lights on like that.

We're trying to advocate what we're doing here through this hearing today to help out greenhouse gas emissions and we should lead by example and start with the State.

Real quick, are you looking at state offices that are also not just in Trenton, but in Newark?

Also, how about those quasi-state agencies; is there any potential to outreach even further to groups like that?

MR. RHODES: I haven't gotten to Newark yet. I am certainly going to get there. You just have a critical mass in Trenton so, naturally, it's been our initial focus, but we certainly want to hit every facility.

The measurement system I have in mind will look at every bill out there so I think through centralizing that bill pay process, extracting the information, we're going to evaluate our performance for every facility.

Now, the second was...

MR. EGENTON: Just the quasi-state agencies. After you're done looking at state government in general, there are a lot out of quasi-state agencies out there, authorities and things like that that are branched out throughout the State.

MR. RHODES: I think it makes sense. I've already had discussions with the Turnpike Authority and New Jersey Transit. While they are a quasi-authority, I think it makes sense that we team up on things.

New Jersey Transit is a part of our consolidated procurement effort, which is underway right now. We are going to be holding a reverse auction in May. So we are talking and I really expect to see, you know.

MR. EGENTON: Just one more quick thing.

I will offer my assistance as you look into the recycling campaign because I've been working with DEP on -- we sort of have a reinvigorating recycling campaign that we're working on and we're doing business-to-business workshops throughout the State in different counties so I'm more than happy to help you out with that.

MR. RHODES: Sure. I'm all for it. Absolutely.

CHAIRMAN BLANDO: Joe.

MR. SPATOLA: Joseph Spatola here.

John, in making your measurements for BTUs expended by state workers, does that take into account their daily commuting with their own automobiles; and if it does, has there been any thought given to the possibility of some fraction of the State employees working from home via computer hookup and whatever?

MR. RHODES: I think that's an excellent question.

The 8.3 trillion BTUs number I shared with you does not include the commuting mileage, at least, I don't think so.

What you raised is an important consideration, as we look at the fleet, we have to recognize that a good portion of that mileage is probably attributed to the commute and then you bring in personal vehicles, you know, for the commute. We have to recognize that.

A lot of corporations in the private sector are doing work-at-home programs. For certain individuals, I think we should give that a hard look, you know. I think it's really an important area to look at.

CHAIRMAN BLANDO: Thank you very much.

MR. RHODES: Thank you.

CHAIRMAN BLANDO: We've just changed the schedule around to assure that our folks coming from out of town are able to catch their trains.

Before we go on, I want to introduce our new member, Pam Mount --

MS. MOUNT: Thank you.

CHAIRMAN BLANDO: -- who is sitting here on the Council. Welcome. Thank you for joining us.

Our next speaker will be Sue Gander. Ms. Gander is a program manager with the USEPA, Clean Energy-Environment State

Partnership Program, which provides states with technical and policy assistance in support of efforts to improve air quality and public health, increase energy efficiency, reliability, security and promote economic development and lower greenhouse gases.

Sue.

MS. GANDER: Hi, good afternoon. It's great to be here and great to be at the DEP.

EPA is a proud partner with New Jersey DEP, the BPU and a number of other New Jersey organizations and companies on a number of energy and air quality efforts and that includes New Jersey's membership in the EPA Clean Energy-Environment State Partnership Program that I represent, but, also, various Energy Star efforts, the National Action Plan on Energy Efficiency, our Leaders Program and the Combined E Power Partnership Program.

What I want to do today is to

share with you briefly how through these programs and effort, we're working to help advance energy efficiency and hopefully give you some ideas about how New Jersey can do more in this area and, in particular, make the energy efficiency and air quality connection.

I want to emphasize and I think you heard this through the other speakers, at least, that I've heard, that part of making that connection and really getting the results is recognizing that energy efficiency can play a broad role in meeting not only environmental goals, but also energy system and economic goals so I just want you to keep that in mind.

Let me just start by saying, I think you have heard this, that it is really a critical time for energy efficiency. There is a tremendous amount of momentum around this issue driven by a number of needs.

In the wake of that, there are still a number of barriers that exist. I wanted to touch on kind of both of those two pieces of it and then start talking about pollution.

There is a number of key energy

challenges that are converging in terms of prices, in terms of supply, reliability, carbonless.

There is a number of air quality

issues that are mounting. We have made a lot of progress in these areas, but in terms of ozone, in terms of particulate matter, haze, mercury, greenhouse gases, there is really still a lot more that we are hoping to achieve.

There is no one silver bullet solution out there, but we think energy efficiency offers a lot of promise. You can kind of see why by looking at this list because it has such a diverse set of benefits.

I think for awhile energy efficiency has been somewhat quietly providing these benefits. It's been out there. It's been helping provide energy system benefits, environmental benefits, economic benefits, risk management benefits.

What we're hearing now is that states and other organizations are really calling for it to do more and there is the potential to do more.

One of these benefits is the cost competitiveness of energy efficiency. This is a chart that actually the folks at EPRI use to show the various costs of different sources of generation and how they compare.

What is interesting is to see how that varies, of course, as the price of carbon goes up. And what we did -- and I don't have a pointer, but you'll see on the bottom there is added the line on energy efficiency, which shows that really under any scenario, but, particularly, as we might be confronting a higher price for carbon, energy efficiency really compares very favorably with a number of other sources. So certainly it's part of the solution that we hope to look to.

In terms of what is still out there, there is still a tremendous amount of untapped energy efficiency.

What we have done in the past couple of years is taken a look at a number of energy efficiency potential studies that have been developed across the country both nationally and regionally. The top black line there is what -- I think this might have been from 2005, but AEO is the Annual Energy Outlook that's developed for the country every year. Their projected energy consumption up to 2025, which you can tell is expected to grow by I think it is 40 or 50 percent in demand.

Looking at what the potential studies are telling us, they are looking at technically achievable, but, also, economically achievable energy efficiency, we think you can cut that electricity growth in half; that amounts to about a 20 percent reduction in demand depending upon how the growth actually proceeds. But even if it is a portion of that, it is really a significant amount of untapped energy efficiency that's out there.

Along with the reduction in energy efficiency goes considerable energy cost savings. If you look at the half-growth scenario, there is about a $20 billion in annual build savings and that would avoid about 40 new sort of mid-size power plants and reduce greenhouse gas emissions by 20 million tons, so some really significant reductions are possible.

As you've heard earlier, this is not news to a lot of people. And certainly, at the State level, as well as the federal level, a lot of activity is happening.

These maps just show a number of different policies that states are putting in place to try to address clean energy. This includes energy efficiency and renewable energy. It's things like renewable portfolio standards and building codes and system benefit funds for energy efficiency.

If you look at what New Jersey is doing, they're showing up really well. New Jersey is represented in all of those things so I certainly want to commend what is going on in New Jersey. A lot of states do look to New Jersey in terms of the example they're setting; and that being said, there is still a lot more that can be done so I think we just want to keep pushing ourselves and keep pushing to do more.

Part of the reason that more can be done is there are a number of barriers that still persist in terms of just trying to get the message about energy efficiency out. I think there was a question earlier about that in terms of the regulatory barriers that don't necessarily incentivize energy efficiency to be the first priority resource that is selected by all these other benefits.

So we're really taking a hard look across a number of programs at EPA and looking at how we can address those barriers and provide best practice examples of how to go about that, provide tools to help quantify and measure the benefits and to, also, sponsor collaboratives among the numerous players that need to sort of all come together and make this happen.

I am going to talk just a little bit about some of those things. I won't go into a lot of detail. I hope you are all familiar with some of the flagship energy efficiency programs at EPA, the Energy Star program. We're very proud of it and how well it has helped achieve results.

If you look at the gray box here, there are a number of different metrics that we look at. 4 percent of electricity avoided through these efforts; that's pretty significant. And yet we do still think that more can be done.

We're continually updating this

program and offering, so, you know, just, just to keep -- because of the demand, to keep moving forward.

And I'll just note here on the national -- the last line here is about national recognition. The most recent survey that has come out is actually that the public recognizes the Energy Star brand or label; that is now up to 65 percent, which we think is tremendous. It probably compares with other major brands that you might think of. The flip side of that is there is still another 35 percent to go. We're very encouraged by that, but we still think there is more to be done.

The next thing I want to just draw your attention to is a pretty significant effort that we started about 18 months ago in partnership with the Department of Energy. It's called the National Action Plan For Energy Efficiency. It released a number of reports. This is the significant summary that we released last summer, but it's another effort that is designed to look at how we can find solutions for increasing energy efficiency.

Its work is really guided by a group of high-level stakeholders that are part of a leadership group. I'll note that there are a number represented from New Jersey and we are very happy to have them participating in it.

What has happened through these last 18 months is that they've come together to produce this report. And in that report, you will see these following recommendations.

At the top, there is the need to recognize energy efficiency as a high-priority energy resource; and that's really, sort of the driving recommendation for a number of these other ones that include making a long-term commitment to energy efficiency, not just sort of jumping in and jumping out and not giving the consistent market signal to energy efficiency, but communicating broadly the benefits and kind of along with the long-term commitment, providing that timely and stable funding to energy efficiency.

And then finally, looking at where policies need to perhaps be adjusted to better align utility incentive to deliver energy efficiency and to try to get away from some of the disincentives that are out there where utilities would actually be losing money if they were to be investing in energy efficiency.

So along with each of these five key recommendations, in the details of the larger report, is information about particular activities that can be taken to kind of get to each of these recommendation so I just really encourage you, if you want to know more, to look there and to think about what New Jersey may not already be doing here. They are doing a lot, but there are things that New Jersey may not already be doing to help achieve some of these recommendations.

We have had actually now over 90 organizations across 47 states through the National Action Plan process make commitments of something they're going to do in terms of setting a goal for their organization, their state to promote or adopt energy efficiency.

In the coming year, we are moving the effort forward with some targeted sector-based collaboratives, looking at particular end-use sectors and helping to develop best practices associated with those, holding regional implementation workshops, so that more people can hear about the information that is being generated.

There is going to be one coming up for this region in Philadelphia at the end of this month. And I know a number of folks from New Jersey have already signed on to be there. So I think that will be a good forum there.

In response to the needs identified by the leadership group, we are developing a number of additional tools and reports, which includes one on measurement and verification and tries to pull together all the information that is out there already on this important topic and try to streamline it and fully advance the ball of this important issue.

I just pulled that out because the

measurement and verification issue just keeps coming back consistently across any sort of time that you start talking about energy efficiency, so I just want to emphasize that part of things.

The other effort that is going on where EPA is working directly with some of the leading states to advance energy efficiency and other clean energy efforts is through our Clean-Energy Environment State Partnership Program. We are happy to have New Jersey as one of those members. They really are, actually, a great source of information for some of the other states represented and a source of good peer, sort of peer learning.

The focus of the partnership is to help each of these states identify the clean energy and energy efficiency options that make sense in their states and then spread that message throughout the rest of the country.

One of the ways we help them do that and that I recommend to folks in New Jersey, who aren't familiar with it, is we've developed a clean energy environment guide to action, which covers 16 different best practice areas. Four of those are specifically focused on energy efficiency, but energy efficiency is represented in a number of the other ones, as well. So it's another piece of the tool kit that is out there to look at.

Going along with the policy-related guidance, there are a number of measurement and modeling and evaluation tools to help create the best program.

I wanted to speak really briefly about what I think is a real live opportunity within this area to make direct linkage between energy efficiency and air quality. I don't know if you've heard about this earlier or not, but EPA was happy to be part of an ongoing initiative that the Ozone Transport Commission is leading to look at what they call high electricity demand days. It's really an attempt to try to get at those peak ozone periods on those hot summer days where they're still getting exceedences.

What has come out of this, and you'll see from the quote that I pulled from one of the slides of the presentations that they recently gave is that energy efficiency along with a number of other measures has really been recognized as an important part of their solution.

EPA helps look at this issue by developing a sort of "what if" scenario for energy efficiency, as well as a number of other clean energy sources and they are looked at from the low, medium, high scenario for increasing energy efficiency.

This just shows you the numbers there between 1 to 2 percent by 2010, between 3.5 and 7 percent reduction from energy efficiency by 2015; that's cumulative because when you put in the energy efficiency, it's going to stick around for at least some amount of time.

I'm going to run through these numbers, but, you know, what we found in 2010 and then certainly by 2015, you're getting some significant reductions in the peak or the daily NOx emissions. This is actually a composite number for all of the air that we modeled, but energy efficiency accounts for at least half of these reductions so a pretty significant amount.

For that reason, I think you've got a number of states, including New Jersey, who are looking at how energy efficiency can be built into their plan.

We are, also, trying to make the connection between energy efficiency and the policies and programs that need to be put in place. We've identified a number of Energy Star programs that are helpful, as well as specific policy measures.

I just wanted to leave you with the bottom line here. There are a multitude of reasons to pursue energy efficiency. It is important to look at removing barriers, as well as providing incentives. I wanted to underscore the importance of robust measurement and verification plans and to, you know, to think big. This is a big opportunity to go from there.

The closer we can get to treating energy efficiency as a resource, then the closer we can get to achieving the full potential for the benefit it provides.

Thank you for your time. I

welcome any questions.

CHAIRMAN BLANDO: Thank you, Sue. I appreciate it.

MR. SPATOLA: Just one quick

question, may I?

MS. GANDER: Yes.

MR. SPATOLA: You're from Washington, D.C.; am I right?

MS. GANDER: That's right.

MR. SPATOLA: How does this whole program mesh with the regional EPA and then funnel down to the State agencies within those various regions?

MS. GANDER: Actually, I'm here because Region 2 asked me to come here and present. I think they were originally trying to make it, so we do work closely with them. It kind of varies. It depends on the particular program, but in terms of the work we're doing with the OTC, the regional offices are very involved, as you know, because they are the folks that really have the day-to-day contact with the states.

There are some things that are done more at a headquarters level, but I think, in particular, in this region, there is a lot of activity and engagement that the regional office has, as well.

So, you know, if you are looking

for sort of who to go to for more information, I'm here to answer questions to get you to the right people, but definitely the regional office, as well.

CHAIRMAN BLANDO: Thank you.

Our next speaker is Paul Flanagan, Litigation Manager, Division of Rate Council, New Jersey Public Advocate.

MR. FLANAGAN: Good afternoon.

My name is Paul Flanagan. I am a litigation manager with the Division of Rate Counsel and the Department of Public Advocate. Seema Singh, who was listed in the program, resigned effective last week after five years as the director.

We are now Rate Counsel and we were are now in the Public Advocate's office. Previously, we were in the department -- in but not on the Department of Treasury. And going back a number of years, we were in the Public Advocate's office. So the rate counsel and rate-payer advocate are essentially interchangeable.

Our charge is to represent rate payers in matters before the various regulatory entities, particularly, the Board of Public Utilities in New Jersey, although we also do a lot of work and have been doing more and more work at both the FCC and the Federal Energy Regulatory Commission.

We also do a lot of things with PJM and get involved with various capacity issues and things like that. And we are also working on the energy master plan.

What I would like to do is just kind of go through some of the things that we do and then certainly answer any of your questions.

As with a number of the other speakers, I commend you. I think what we have found out is that energy conservation and efficiency are really the best methods of doing a lot of good things for the State: Reducing the peaks, saving money and a whole number of other things.

We actually have an energy

conservation book that we have available at our website. It is www.rpa.state.nj.us. And it's available on line. And among the things we have in there are a number of conservation tips that we provide to our clients, to the rate payers, including things like there is a discussion of a home energy audit that people can do to save on that.

We have said throughout the past year, particularly, with the high price of energy over the last couple of years after Katrina and the hurricanes and the run up of natural gas prices, which also then affected electricity prices, that the single best thing that consumers can do to number one lower their bills, but also to conserve energy, which has a larger benefit for the State is to conserve.

And we have -- we support those programs that the Board has put in place and we're working very diligently in the energy master plan and with the various utilities and various other working groups to try to reduce those peaks. The peak tends to be the worst for air quality, so to the extent we can reduce the entire peaking issues, it's beneficial for the State.

One of the things that we have also been involved with is with PJM and with some of the regional items.

One of the issues that comes up is to the extent our base load goes out of the State, it will increase the peaking needs, which, therefore, is bad for the air.

There are a number, as you may be aware, of existing and potential projects where the power from New Jersey is being taken, particularly, to New York. There is the Neptune project and a couple of other ones, who go to Staten Island.

The problem for New Jersey is when that is taken out, we have to get more power from the west, from Pennsylvania, in particular, which is typically dirtier for the air and which also ends up costing us more money in terms of transmission, upgrades and things like that through PJM.

So that's one of the things that we are trying to get a better handle on and to try to get into certain portions of the energy

master plan so that we can have a discussion
of that and try to prevent some of those
things.

I was told by one of the people in

my office today that they were at a PJM discussion yesterday and, apparently, based on PJM's projections, we're going to have energy capacity problems within five years.

One of the concerns we have is if those are addressed through peaking plans, etc., that, again, will be worse for the air. Also, some of the older plants, they're talking about trying to extend the life of those. Typically, again, they are worse in terms of air quality.

What we've done in the context of the energy master plan, we have -- the way our office works, we have a staff of attorneys. We hire consultants. We hire accountants. We hire engineers. We hire financial people.

We have been involved, on behalf of the Public Advocate, as his representative, on a number of working groups, in fact, all the working groups that have been involved. We have participated in various reports that have been presented and are being presented to the State agencies that are doing the master plan. And a lot of these energy efficiency and clean energy items come up in that context.

So what I would like to do is just address a couple of things. A couple of things that we have seen in there, and I note that the gentleman, two speakers ago was talking about it, the State office buildings; that is certainly an area.

Another item that we think is important, and I was at a conference last week, an energy conference of engineers and there was a representative from the leading municipalities who said that even though they are apparently pushing it, there are only six or seven municipalities in New Jersey that have their own master plan for energy efficiency and energy -- just energy needs and things like that out of 500 and whatever, 556 municipalities; that's a pretty anemic amount.

I think a lot of the things that are being spoken about in the State would also apply to the various municipalities and they could do some of those things. I think that is something that, you know, your group may support.

Another item I would like to talk

about is with regard to RGGI, the model rule came out, I guess, in August and we have been following that. We have made comments on that and we anticipate, I think, shortly that the State rule will come out.

One of the biggest items from our office is the distribution of allowances under the model rule. I believe the recommendation is 25, at least, 25 percent growth to the rate payers.

Our recommendation is that they be sold and that 100 percent go to the rate payers. The rate payers basically pay for these programs. We think they should get the money back. We think if those allowances are given to the generators, it just essentially is a windfall for them.

With regard to the BGS proceeding, which is Basic Generation Service Power Supply, there are a number of areas we think the boards should look at. We've talked about some of these in our filings with the Board and I've listed them here in a transparency, the various areas we think that the State should be looking at longer term.

Right now, the energy for New Jersey is acquired over, basically, for a three-year period. We think a longer term would be more beneficial. It could reduce the costs. Some of that money could then be used for various other things.

We think one of the things that should be looked at is the possibility for a power authority, either to acquire plans or to acquire a portfolio of power.

One of the reasons I am talking about these things is all of these things, I think, apply to clean energy. Utilities will typically do what they're told. They're interested in energy efficiency, but they're also interested in making money and if they get things on pass through, that's what they'll do. A lot of the money comes from the rate payers. We believe most of the money comes from the rate payers. We believe that it's important that everyone who has a stake in this participate in reducing these costs.

Similarly, with renewable portfolio standards, we support the Board's 2020. One of the things we have suggested is that there be more benchmarks and milestones to make sure we're achieving the things we're looking to do. And part of that is that there are existing solar rebates and things like that. We think that that ought to be reviewed periodically and make sure that we actually are going to achieve those things because if we don't, we're going to end up spending more money and not get to what we're looking to do. We also believe it needs to be put into the context of the energy master plan.

One thing that is coming down the road and has been, at least, a pilot program is decoupling. Decoupling is when the utilities no longer necessarily receive their income, if you will, or their earnings based on the amount of investment they have.

One of the reasons for that, and it's a national trend, is because what is typically happening is conservation cuts into the sales and utilities lose money. And they either have stranded investment, which they don't want to have, obviously, or they are looking for another way to recoup the money. Decoupling allows them to, even if they foster -- in other words, if they stop trying to sell gas, if they stop trying to sell power, but they receive the still receive the same return. We've looked at that very carefully.

There are two pilot programs in New Jersey now, one is New Jersey Natural and South Jersey Gas. We've looked at that very carefully to try to make sure that the rate payers are protected and that it just doesn't become a free ride for the utilities. The benefit of it is that the utilities are then pushing conservation, instead of pushing selling gas or electricity. So there is a benefit, but it's a fairly new program throughout the country and that's one thing that we looked at.

I guess the last thing I would like to say is that three of the key things that we think need to be looked at in all of these issues are the cost, reliability and efficiency. And sometimes they're related and sometimes they're not. Very often what happens at these meetings that we go to is someone will say, Well, it will cost x dollars and they don't decide who is going to pay it. The assumption is that if you, for example, make utilities put something in, it will get paid for. Well, it gets paid for by the rate payers and that's our concern. We want to make sure that the risk and reward benefits are there for the rate payers. We think that ultimately benefits the State.

We think overall reductions are helpful and if we can avoid either extending power plants or building new power plants, we think that's beneficial and we've been looking at all these various topics, but our underlying concern is actually the rate payers. The rate payers are paying an extraordinary amount of money. I think it's on the order of $300 million a year through the societal benefits charge for a number of these programs. We have to make sure that the programs that are in place are effective so that actually we're getting what we're paying for.

Thank you very much.

CHAIRMAN BLANDO: Thank you.

Joe.

MR. SPATOLA: The only question I have is you very quickly said your agency's website.

Could you do that again?

It's not on your handout.

MR. FLANAGAN: It's www.rpa.state.nj.us.

If you can't get it any other way, you can go to the State of New Jersey website.

CHAIRMAN BLANDO: Thank you.

Our next speaker is Greg Dana, Vice President -- Fred.

MR. FUENTES-COTTO: I have one question.

So you mentioned that rate payers right now would get, at least, 25 percent under the distribution of allowances rule.

What is the potential for the rate payers getting 100 percent?

MR. FLANAGAN: The model rule, which was the greenhouse gas -- I guess it was eight or ten states involved in this, New England states, New Jersey, Maryland and a number of them. They came out with a -- after that coalition was set up, they came out with a model rule, basically, to try to put it in place. And I gather we were not a party to it, but the BPU was, and I think the DEP was, as well, because DEP is going to have to issue the rule, but it was essentially a compromise among the states as to what would happen among these allowances and that the agreement was that a minimum of it, 25 percent would go to the rate payers, the other 75 percent would be up for grabs, if you will, in each state. For example, I believe Vermont has passed legislation that 100 percent of it goes to the rate payers there.

Our recommendation, and I'm sure if you had some generators here, large energy users or various other interested parties, they would tell you that, you know, for various reasons, but our belief is because of the fact that the rate payers have funded a number of these programs and it's their money, essentially, we think they should get it back

100 percent.

So that is our recommendation and that's what our comments have been in the model rule. We, although we haven't seen the draft, have already made that comment to the DEP commissioner in correspondence from Seema Singh when she was the rate payer advocate, but that's the basis of it, that we think they're entitled to the money because it, essentially, goes along with the generation and they have paid for those things.

CHAIRMAN BLANDO: Our next speaker is Greg Dana, Vice President of Environmental Affairs, Alliance of Automobile Manufacturers.

MR. DANA: You'll have to bear with me. I've been losing my voice for the last few days so hopefully you can hear me okay.

I am going to talk about all we've been doing to improve fuel efficiency in the last 20 years and then I'll talk about a few other things later on.

These are just some facts about what has been going on with the auto industry recently. Again, we've done a lot of things to improve efficiency over the years, even though we don't get a whole lot of credit for it, but we have been doing a lot. Part of the problem has been that we've grown the number of vehicles we have in this country tremendously. We also have grown the number of trucks we sell in this country tremendously. Back in the 1970s, trucks were 19 percent of the fleet. And now, they're 50 percent of the fleet; that's again, consumer preference. We can't control consumer preference. We sell what they want to buy.

And the other thing that gets everybody in this country is vehicle miles traveled. Vehicle miles travelled continues to grow about 2 percent a year. One of the funny things about making cars more efficient is, if you make cars more efficient, people will drive more miles and travel further from their homes.

Where I live is a good example, if you're a military employee that's stationed at the Pentagon, you can't afford a house unless it's 20 miles out of the beltway. But if fuel was cheaper or your car more efficient, you will go even farther out and drive all those miles because, to you, it's not a very important point in the purchase price.

This is to give you a sense of how

many types of cars we're selling and today it's primarily trucks. And again, that is what consumers are choosing to buy. Sport utilities, pickups, midsize cars, again, minivans. I think every state in the nation now, 50 percent of the sales are now light trucks.

This is -- EPA did it, actually. This is 1975 to 2005. I guess this is in ton-miles per gallon. This is an EPA trends report. We have raised efficiency in cars and light trucks by 2 percent per year since 1975. Again, not something that gets seen very often and not something you hear about us.

And again, part of what we have to balance as auto makers is people want more and more and more of everything that is power-generated or power-operated in a vehicle. This is an example of how much rates for optional equipment have increased over time on various and sundry optional equipment.

See how air bags are now mandated 100 percent across the board. And again, all these add weight to the vehicle so part of the balancing equation is how do you add weight, make the efficiency better and also meet the emissions standards.

I am going to give you three examples, and again, this is back to the balancing -- the thing we have to do to sell cars.

This is -- I have a BMW and I like BMW 3 series, but that's beside the point, you can see how the efficiency of the car, on the mileage sense, has gone up even though the engine size is greater, the horsepower is greater, the acceleration is better, the torque is better and the emissions are much, much lower. Again, that's part of the balancing equation. You have to try to make everything work the way it should. And consumers, by and large, want power, they want performance, they want reliability in the cars they buy. We have to meet that consumer demand. Again, the Toyota Camry, Corolla, the same sort of thing. Mercedes Benz E class, again, the same sort of things that we see.

In our manufacturing plants, we've committed to reduce greenhouse gas intensity by 10 percent by 2012; that's something we're currently involved in right now. If you go into an assembly plant, you will realize they're incredibly efficient at what they do. And that makes sense because most of this energy, it just costs money, and plants tend to elect not to spend so much money. These guys recycle everything they use. BMW's plant in South Carolina uses landfill gas for heating the whole plant and working their paint shop applications.

We make or we invest about 15 billion per year in research and development as an auto industry across the board; and that's, again, to try and make products better, to make them more efficient, make them cleaner to drive in terms of emission standards.

One thing I would like to point out to people is that GM tried in 1981 to build what is called the Cadillac V864.

Does anybody remember that

vehicle?

It was an attempt to shut off two cylinders and four cylinders to make the car more efficient. It lasted about a year of sales because it didn't work very well; that is, because we didn't have the computers and electronics that we have today.

Now, there are at least four or five models on the road, with cylinder deactivation, where half the cylinders shut off on the car on the highway and you don't even know that it happens. And that is about 8 to 12 percent benefit in fuel economy. That took us 25 years to develop properly.

I'll skip that slide.

I was talking to John, our first speaker after lunch earlier, and we have about 200 models that get more than 30 miles per gallon on the highway. Unfortunately, the sales of those vehicles are very low. People buy the SUVs. They buy trucks. They don't buy the small cars that we make. But again, that is a pretty amazing statistic if you think about it. There is about 200 models that achieve more than 30 miles per gallon.

And almost all models today have some sort of very fuel efficient technologies on them. And again, we continue to push advanced technology vehicles. We expect to bring clean diesels back into the marketplace probably by the 2009 or -10 model year. We have to meet a very tough NOx emission standard in this country to sell them here, but they're coming.

Hybrid electrics are here and we're still working on internal combustion engines and fuel cells fueled by hydrogen, so most of those are on the long-term horizon.

The Energy Tax Bill that passed Congress had incentives in there for people buying hybrid vehicles and other advanced-technology vehicles. That has been very helpful because these cars do have a premium price on them. And if the State of New Jersey wanted to do something to help out, you could also put incentives on these cars and that doesn't mean just financial incentives.

The State of Virginia sold more hybrids than most any other state in the country because they let hybrids use the HOV lanes. And I can tell you, I used to drive the HOV lanes and every car in the HOV lane was a hybrid, just about. Because D.C. is so congested, that's a huge incentive to people.

Just again, so you know that the light-truck standards are being revised federally up to 2011. And by 2011, they'll have to meet a standard of 24.1; that's up from a standard of 20.7 not too many years ago. And that's a stretch for us in terms of the trucks we make today because trucks do perform work and do carry loads for people, even though many people buy trucks for other reasons.

As you probably know, we're suing the State of California over the fuel economy standards they put in place. We're doing it for a couple of reasons. One, it is federally preempted, and we don't know -- CO_2 is fuel economy, it's a carbon-balance equation, for all you engineers. EPA labels cars with measuring CO_2 in the tailpipe and recording it for the miles per gallon label package. So that's how you get miles per gallon.

California estimates that the standards they put in place would be about $1,064 per car. We think their numbers are a little bit off. They made some mistakes in their calculations. We think it's closer to $3,000. We're very concerned because unlike emissions, you can't just put a catalyst on the car to control fuel economy. You can add technology, most of that we've already added to cars today. We think we are going to have to make cars smaller and lighter to meet the standards in California and this state already has adopted those standards so you will probably get fewer models and lighter cars and trucks than you have today.

Again, California standards are very extreme, if you convert the CO2 number to miles per gallon, by 2016 they would have us being at a 43.7 mile per gallon standard; that's compared to the current standard per car of 27.5 federal. Again, that's just something that would require us to make major modifications in the size and weight of vehicles.

Again, this just makes the point

that most vehicles on the road today are trucks and the majority of vehicles being sold are trucks and a lot of people use them for towing boats, which you might say is a luxury, but some people have those, but a lot of people use them because they have large families or they have trades and they need to carry things around in them.

And, again, we're willing to improve the efficiency of the vehicles even further; but, again, what we would like to see is a strong national program. We can't afford to have each state setting separate standards; that would drive us nuts in terms of distribution of vehicles. NHTSA sets the standards currently for the CAFE program and they have to follow certain guidelines.

This is what NHTSA has to consider when it sets standards, technological feasibility, safety, affordability, emissions, consumer choice and effects on American jobs. Those are important points. And we can share confidential emissions information with NHTSA because they will protect that confidential emissions information. They look at what we can do -- we project we can do four or five years out and then, looking at the latest other factors, what weight and safety adds, what emissions standards we have to meet, they set standards that make sense with all those considerations.

I tried to show as much as I could, but this is who our members are and I don't know if you caught any of the testimony of four of our member CEOs before the House Energy and Commerce Committee not too long ago, in essence, what they said was we are willing to work with Congress on a cap and trade system for carbon control, we would like to see a strong national program, we would like to see NHTSA, at least, handling it because of preemption, because of the considerations we have to do with confidential business information.

But I think it's safe to say that we're willing to do whatever we can to help out. We would just like to get some credit for what we did in the past.

With that, I'll be happy to answer any questions.

MR. ELSTON: Yes, I am John Elston.

I have a question on federal preemption. And the question is: As you know, New Jersey has adopted the California light-duty vehicle standards, which will go into effect in 2009 model year vehicles.

If New Jersey prevails in its case -- lawsuit against EPA and the manufacturers, will New Jersey get those vehicles automatically, including the CO2 components?

MR. DANA: California has embedded the greenhouse gas standards in their title of the law that could pass the emissions standards in it; so yes, you have those automatically.

And if we do -- if he obviously loses the lawsuit on federal preemption, I can't tell you for sure what will happen, but we think the cars that are sold in the states with California standards will be significantly smaller, lighter and less able to carry loads and that really affects the trucks particularly, but it will affect cars.

And I should tell you what Toyota

said when AB 1493, the law that was passed in California three years ago, Toyota said at that time if they had to meet that law today, right away, without having any time to manufacture their cars differently or anything, they could sell the Echo and the Prius in the State of California.

MR. ELSTON: When was that said; do you remember what year?

MR. DANA: That was three or four years ago when the AB 1493 was passed.

MR. ELSTON: What do you think by year 2009, however?

MR. DANA: Well, I mean we're going to have, I guess, return to diesels in the marketplace in 2009, which will help somewhat. There are some things we can do with different, slightly lower weight cars without getting any exotic materials; but, again, we don't see how to get to the numbers California has put in place without major redesign of the vehicles in the smaller and lighter categories. We just don't know how to get there.

CHAIRMAN BLANDO: Thank you very

much. Tom.

MR. MAXWELL: Any idea when the Supreme Court will make that determination for that rule?

MR. DANA: They just did. It was last week.

MR. MAXWELL: Thank you.

MR. ELSTON: He means the California case.

MR. DANA: Oh, no, the Supreme Court ruled on the Massachusetts v. EPA case last week. The California case is not before the Supreme Court. It's with the District Court in California. And we've also sued Vermont and court -- the actual trial is going on right now this week in Vermont, so that's still to be determined. We expect it will go to the Supreme Court though.

It will be many years.

CHAIRMAN BLANDO: Our next speaker, actually if you bear with me, would be Paul Genoa from the Nuclear Energy Institute. I know you have a train you have to catch.

MR. GENOA: Good afternoon and

thank you very much, Clean Air Council members, for the invitation to be here with you today. I appreciate it and I will be happy to share some thoughts with you.

The last speaker was a good lead-in because, in fact, I borrowed my wife's Camry hybrid this morning so I could take the HOV lane into Union station and get on the train and come up here and visit you today.

I want to talk a little bit about how energy efficiency, particularly on the supply side, has led to significant clean air benefits in the United States today.

Energy efficiency, as you might know, has two dimensions to it. You've heard most of the day about the demand side, energy efficiency issues and there are truly huge opportunities to mine there in that sector, but the demand side, excuse me, the supply side has already been exploited to a large degree and will continue.

Perhaps this is easier because on the supply side, it is in any industry's best interest to reduce their costs. And because their costs tend to be larger, it's easier to find those benefits, mine them and implement them, whereas the demand-side efficiency gains tend to be more disbursed and many, many more individuals have to look for those opportunities and it's perhaps harder to justify in the short term, but again, there are multiple opportunities.

So those supply-side gains, particularly within the nuclear industry that I'm involved with, have yielded significant clean air benefits. And that's with regards to reduce not only greenhouse gas emissions, but criteria pollutants, as well.

And then I want to end with, really, an optimistic view for the future about what can be, and about how in one sector, nuclear energy can go beyond the traditional role it's played today to provide some significant clean air benefits in the future.

I should take just a minute to introduce myself again, Paul Genoa with the Nuclear Energy Institute. The institute is the Washington-based policy organization for the nuclear industry. We represent about 270 corporations in 20 nations worldwide and uniquely, we do represent 100 percent of the nuclear power companies in the United States and so we speak for them on regulatory, generic regulatory issues, as well, but we also represent companies that are involved just purely in nuclear technology, research of medical applications and so forth.

Well, the rest are all pictures, so this is going to be really easy.

What is energy efficiency.

You know, one measure of energy efficiency is just getting more output from an existing asset and we've excelled there in this country since the 1990s. We have 103 nuclear power plants in this country.

If you look at the installed electrical capacity in the United States, we have about a thousand gigawatts of nuclear capacity and we only have about a hundred gigawatts of nuclear capacity. So we only have about 10 percent of the installed capacity in the United States and yet for almost 20 years we've provided 20 percent of the nation's electricity. So we're getting a lot of energy out of those plants. Those plants are online continuously. So, again, getting more energy out of an existing asset is one measure.

The second is really, well, what does that mean, getting more electricity out of it?

This shows a chart of the actual kilowatt hours produced. This is a billion kilowatt hours since 1990 to 2006, the last year we had data.

What you see, the yellow line down below is essentially what you had in 1990, everything above it is additional. Now, it starts at 500 so there is a lot more below it, so the percentages are different; but what you are seeing is a significant increase in output from those existing plants. On average in 1990, the fleet, the 103 plants across the United States, produced less than 70 percent capacity factor. In other words, they were operating less than 70 percent of the time they were able to.

For the last six or seven years, we had averaged right at 90 percent. That

20 percent increase in capacity output is huge. It's equivalent to adding about 26 large nuclear plants across the country and, in fact, it has made a significant

contribution just meeting the electrical demand over the last 20 years.

What does it mean in terms of air pollution?

Well, if you look at just this one, this one particularly looks at carbon dioxide. If you sum up that increase and you realize that nuclear power because it doesn't provide, doesn't emit greenhouse gases, it offsets electricity from a mixture of sources that do. On average, that increase is equivalent to about 2 billion metric tons of carbon avoided, a pretty substantial number.

And, of course, along with that increase in capacity also means you're making more electricity out of the same asset, the price goes down so our electricity prices continue to drop, last year 1.65 cents per kilowatt hour reduction, average across the entire country, dirt cheap.

Well, what is 2 billion metric

tons?

That's a really big number. We've heard a lot about tens and hundreds of metric tons today. I'm talking billions of metric tons.

Now, you've heard about the Kyoto Protocol, and in that process they have a thing called a "clean development mechanism." This is a mechanism where countries can invest in projects that will reduce carbon emissions, greenhouse gas emissions around the world. Those projects in total during the entire period up to 2012 will offset about 1.2 billion metric tons of carbon; that's what we've already avoided. And if you look at the worldwide trend, since 1992, the worldwide nuclear fleet, which is about 446 plants, avoids over 2 billion metric tons every year. So right now, it's about 2.6 billion metric tons, a substantial amount of carbon emissions.

Why is that?

Well, it's because nuclear energy, because it's a large-scale producer, avoids more metric tons than all other renewables combined. It's a very significant amount. And that amount, 681 million metric tons of carbon, it's a big number, if you really wanted to keep our U.S. carbon footprint the same, flat, and you decided you wanted to take nuclear power off the table, you could do that, you would just have to take virtually all the U.S. passenger cars off the table, too, about a 130 million passenger cars. So it's a pretty big number and it's unlikely to go away soon.

Now, some people say, Well, wait a minute, you guys talk about nuclear power, and you don't emit carbon; but really, in the life cycle of the plant, you have to build the plant, trucks have to bring the concrete in, you have to operate the plant, you have to shut it down and decommission, take care of the fuel. You need to do a life cycle analysis. And, in fact, several of those have been done. And in those analyses, this one happens to be from the International Energy Agency, but in those analyses, we consistently are comparable with renewable energy in our life cycle carbon emission footprint.

Remember, you have to fabricate windmills and solar panels, too, and there are other implications.

You would think, Well, about what

about hydro; hydro can't give off any CO2 can it?

Well, in fact, it puts off methane. I mean we all love hydro. It looks good. We want more of it, but you have to recognize there are CO2 implications with that, too. You also have to bring in trucks and pour the concrete and build the damns; but, also, as the reservoirs fill, you have muck and mud in the bottom, you have microbial action, you have methane production. Still a good thing, we want more of it, but you have to keep in mind what is relative.

In the United States, as far as electricity, nuclear power is 73 percent of the non-emitted sources of electricity. So as you look to the future, renewables are very important, but renewables today are in the 1, 2, 3 percent category and a massive effort to get them up to 6, 7 percent is worthwhile. But remember, you need a lot of electricity today even with energy efficiency.

So we were talking about CO_2 emissions. And as you look at all the different voluntary programs, you know, other than the states right now that are working towards mandatory controls, nationally, right now, we have only voluntary programs and the electric sector is part of that.

Nuclear energy last year represented 36 percent of the total CO_2 reductions on a voluntary basis. If you look at just the electric sector, we are 54 percent of the reductions from the electric sector.

I will leave this report for the committee, this is the Power Partners report that is submitted to the Department of Energy, on our voluntary CO_2 emissions reduction program.

Well, what is another way to get energy efficiency?

Well, it's to get more energy out of those plants. And one way to do that is to run them harder and longer, as you've seen before.

Another way is to actually retool

the plants in your routine maintenance to enhance the generators and other components and eke a little bit more energy out of every plant. And we call those "uprates." So you can get power uprates at those plants and you can see the approved uprates, the under-review uprates and the expected uprates that will occur and it's about 6,000 megawatts of capacity or about the size of six large nuclear power plants and those are well underway.

Another way, of course, is to restart an asset that was once shut down and this is the Browns Ferry Unit 1. This is part of the TVA complex. They went in and looked at building a brand-new plant there. And they said, We'll do the study. It looks like we can refurbish the old plant but with all new components, cheaper than we can do a new plant and with less risk. Let's do it.

$1.8 billion, back then, it looked like that's way too expensive. Why don't you build a new plant? Today, it looks cheap so it's coming on line next month. You'll have an extra 1200 megawatts of capacity, bringing the nuclear fleet up to 104 reactors, about 20 percent.

MR. EGENTON: Where is that plant located; is it in Tennessee?

MR. GENOA: It is not in Tennessee. I believe it's in Alabama. I'm not totally sure. Browns Ferry.

And then, again, how else can you extend or gain additional efficiency out of that investment in those plants?

Well, we have 103 plants soon to be 104 plants, you can extend the life of those plants through maintenance and uprates and relicensing. Currently, 48 of the 103 plants have already received license renewal to go ahead and operate for an additional 20 years. We've got -- 22 have announced their intent, 25 intend to. Virtually all the plants will approach it and virtually all will receive it. There may be one or two for a variety of economic reasons, probably not to do with the plant, but perhaps modification, add on, 1306B, 1305B -- what is it? -- the EPA rules on water may actually end up shutting down one or two plants, but these plants being able to operate that much longer producing electricity. They don't emit either CO_2, NO_x, SO_x, particulates, mercury, and so forth. It would be an advantage.

So what about the future?

I talked a little bit about what the current fleet is doing. And you need to understand that in addition to the restart and the uprates, we have over 30 plants in prelicensing right now. Virtually all of those, if they're built, will be built in the southeast, in the United States. Those will be evolutionary plants. They will be upgrades of existing light-water reactors that are used in the United States and used mostly around the world.

But we are working today to develop prototypes for what we call the next generation nuclear plant, which will be a high-temperature gas reactor. It will be a small reactor and you can really think of it as a process heat machine because it won't necessarily be there for electricity and it won't necessarily be electric utilities who want them. In fact, what it will do is provide other opportunities beyond the traditional electric sector.

There are two other ways you can get energy efficiency and that is you can start to implement a smart grid that allows electricity to be transmitted more efficiently and smarter so that appliances can turn on and off when they're supposed to and so forth. And what that can do is also enable electrification of other sectors like the transportation sector.

You heard about plug-in hybrids. Well, plug-in hybrids don't need a whole new infrastructure. The infrastructure is already there. We have an electric grid. It serves everybody in the nation. All you have to do is develop the battery technology, plug these cars in and perhaps the first 40 miles you drive, which is the average of what people drive, will be on electricity.

That's at a price of about a dollar per gallon, equivalent of gasoline, and has a lower air emission than gasoline, ethanol or diesel. And so if you can electrify that, that provides some advantages.

What it also does is it tends to levelize our demands so we don't have the big peak-and-valley.

So if you can use those existing

assets for a greater amount of time, they're more efficient and you can get more energy out of them and less waste and pollution.

But beyond that, hydrogen, you heard about hydrogen fuel cells and the potential for a hydrogen economy, that may be way down the road, but we use a lot of hydrogen today and we use it in our refineries to bring up the quality of crude oil, to sweeten it because the crude oil is not as good as it once was. Hydrogen is used to do that and that hydrogen is cracked from natural gas and when you do that, you emit CO_2.

This type of a high-temperature gas reactor can produce hydrogen through several different mechanisms more efficiently and with no CO_2 emissions. And that would provide the future with an opportunity to refine petroleum products, to develop hydrogen-4 fuel cells, distributed energy, and fuel-cell vehicles and so forth.

It also will allow for the fertilizer industry and so forth to come back. Some of those industries have left the United States because of the high cost of natural gas, perhaps this will allow them to come back.

Finally, because this technology is a high-process heat application, it can allow for the extraction of fossil fuels more efficiently than is currently done. Today most of your fossil fuels are used to extract, process and transport other fossil fuels. There is a clean air penalty associated with all that activity.

So when you hear about energy security actions to drive us towards ethanol, well, there is a CO_2 footprint there.

Where is it from?

Natural gas to heat up the ethanol product. If you can use process heat from a machine like this, there is no carbon emissions.

If you can look towards coal to liquids, converting coal to liquid, that's a great technology for energy security. Right

now the largest plant on the planet is in
South Africa, but guess what? It is also the
largest plant source of carbon on the planet.
You pay a big penalty when you convert coal to

liquids for transport fuel.

If you can do it with nuclear energy, you can do it cleaner. You hear about the tar sands up in Canada or the oil sands, well, in the future, most of the natural gas coming out of Canada will not come out of Canada. It will be used to heat up steam to heat up Canada to extract oil from those sands; that's incredibly energy intensive. If you can do that with a process-heat machine that doesn't give CO_2, you can save that natural gas for important applications elsewhere.

So there are lots of opportunities, it's looking very exciting. This is in the future, but we're working on it today.

Now, I'll take any questions you might have.

CHAIRMAN BLANDO: Joe.

MR. SPATOLA: I am Joseph Spatola.

With regard to the perception about nuclear power in this country and for the potential building of plants and all that, what kinds of changes have occurred over the course of the past couple of decades in terms of safety issues that seem to be a constant concern to the public?

MR. GENOA: Actually, the public is more supportive today than they've ever been. More than 70 percent of the public support using nuclear in the future; 80 percent of the public around existing power plants would welcome another power plant at that site and that's excluding people who work at the plant. So really, right now, we have sufficient public acceptance to build the plants; that's not a problem.

MR. SPATOLA: What is the basis for their feeling so secure about nuclear power?

MR. GENOA: The plants have operated, producing 20 percent of our electricity for 50 years. We did have the Three Mile Island accident. There was no one injured. So we've had a 50-year history with no one hurt. That's a pretty good record.

MR. SPATOLA: But has the technology changed in terms of these plants with, what you call "fail-safe"?

MR. GENOA: The truth is they probably were fail-safe before. If you remember it, had the operators at Three Mile Island not been asleep, it wouldn't have happened. It was human factoring that overran the machine. Huge amounts of change have occurred from those lessons. The plants have been completely modified over a 20-some year period since Three Mile Island to improve the human-machine interface. We have simulators in every power plant that allow the operators to go through severe accident training with real control rooms that look just like the ones that operate the plant.

And we have probabilistic risk or probabilistic safety evaluation tools we never had before that we can look at these complex systems and identify which are the systems that are truly important to safety and we can focus all of our attention and maintenance on those activities and that is what has really taken us from 70 percent to 90 percent availability. We now know the critical components of the plants, how they need to be maintained, how they need to be operated and we can do it safely.

The new plants, the evolutionary plants that we talked about will have significant enhancements. One of the main indicators of plant safety is what we call "core damage frequency." How frequently is it likely, operating this machine, that you would damage the core, hurt the fuel and cause a release that might require people to evacuate or something like that?

Already you're down in the 1 in 10,000 or below level. The new plants will go to another hundred to a thousand-fold below that already established safety level so that's important. We've learned a lot about fuel and fuel performance and so forth. And then plants like these, the high-temperature gas reactors, we don't like to talk about it that way, but this idea of fail-safe or walk-away safe or whatever tends to be true.

The plants are designed such that

you can't melt the fuel. There isn't enough energy within the fuel design, within the reactor, to elevate the temperature sufficiently to breach the coating on the fuel that would allow the radioactive material to go away. So there have been significant improvements in our understanding, our knowledge and our operation, but most importantly, to the operation.

Today these plants are operated by professional utilities that focus on nuclear, not as a hobby having one or two plants, but rather as a fleet operator. So you've seen a consolidation in the industry down to -- well, it used to be 40-something when I joined in '95 and now it is probably in the range of 20-something so the fleet is cut in half with just a few key operators owning most of the fleet.

MR. ALI: Just a quick question; that is, that the concern about the waste fuel disposals.

Has the situation improved or is the waste piling up?

How are you taking care of those

things?

MR. GENOA: All the fuel that has ever been created in the United States is where it was, other than a few minor shipments between plants. So it is all at the plant within its fuel pool or it's within dry storage containers that have been licensed by the NRC. The NRC believes that those dry-storage facilities are safe for perhaps a hundred years so we have time to implement our long-term plan. There has never been any doubt about what the ultimate solution to used nuclear fuel is, it has always been an international consensus of scientific opinion that the geological repositories are the appropriate disposal option.

In the United States, we have a federal law that has required the development by the Department of Energy of a repository in Yucca Mountain, Nevada, that repository has been found suitable by the government and that decision made by the President has been upheld by Congress.

Now, surely, it is a controversial issue and the State of Nevada objected and it was overwritten by Congress, that was in 2002. Currently, we are in what you call prelicensing for the repository.

Now, today there is renewed

interest in perhaps looking at a new management option that would be in addition to the repository, not eliminate the repository, and that's the idea of recycling the value, the energy value out of the fuel and, in doing so, reduce the toxicity and the volume of the remaining waste; that technology has been demonstrated at pilot programs at our national labs, but has never been demonstrated on a full-scale project. It also requires advance reactors to consume this waste material as a fuel and that, while that's promising and should be pursued and there is R&D money going forward, almost $500 million this year to study that problem, it would not be available while you're alive. Maybe 2050 we'll be talking about seeing that level of implementation available.

The good news is there is sufficient uranium around the world to support a revival until that time and also the waste is safely stored where it is and can safely be stored for a long period of time, although there are some decommission projects where it clearly should be moved to a DOE federal facility.

Does somebody have a soft drink can up there, by the way; nobody brought one?

Hold up one of those cups in front of you.

Just as an illustration, if you were to take the -- remember the fuel that you use is the fuel that needs to be disposed of, the fuel you would use in your life for your family to make the electricity that you would need for your whole life would fit in that cup and that's how much waste you have to dispose of.

Now, can the United States with its scientific abilities manage that level?

Right now, all the waste that we've generated for 50 years will fit on one football field 10 yards deep. It is serious. It needs to be managed properly. It is hazardous, but this is not an insurmountable problem.

When we talk about carbon sequestration, putting billions of metric tons of carbon underground, now we start to talk about a tough problem. I believe we can do that one, too, but just keep it in perspective.

MR. ELSTON: I have one question.

John Elston.

The two areas of where the existing plants seem to be making progress is operating capacity and in some modifications to some of the plants.

On the latter one, I was going to ask, are these considered major modifications and do you have to go back to the Nuclear Energy Commission in order to get approval and relicensing, perhaps, and do the state regulatory agencies get involved in those modifications and renewals?

MR. GENOA: Yes.

Every significant change to a nuclear power plant requires a license amendment. A relicensing is a significant effort and needs a relicensing process and so it is highly regulated. It's open to the public at multiple stages. The states do have input. The states do not have authority to regulate the health and safety associated with the use of radioactive materials at the plant, period.

They insert themselves in many different ways, but they do not have that authority. They have the authority over permitting for a new structure and often that bleeds over into a belief that there are other authorities. But the states have significant intervention in terms of air use and water use and hazardous-materials storage and all sorts of things, as any other industry would have.

MR. O'SULLIVAN: I'm Bill O'Sullivan. I'm the air director here.

One of those overlap items you spoke of, we have a proposal out right now for, as you call it, an uprate at the Hope Creek Nuclear Power Plant owned by PSE&G. There will be a public hearing on May 1st down in the area of the plant. It's for a 20 percent capacity increase and the reason we're involved is the cooling tower and its particulates, we have a permit for that.

Increasing its capacity by 20 percent, would increase the particulate emissions. Hence, it's a significant modification of their operating permit. They need to get a permit from New Jersey and they also need a variance for our particulate pool; that has been reviewed. We found it to be acceptable. We are seeking public comment and we'll proceed based on the public comment we receive on -- I believe the hearing is May 1st.

CHAIRMAN BLANDO: Thank you.

MR. GENOA: Thank you.

CHAIRMAN BLANDO: Our next speaker is Dr. Frank Felder from the Bloustein School up at Rutgers. I greatly appreciate your willingness to delay your presentation and I apologize for the delay. Dr. Felder is the director for the Center for Energy, Economic & Environmental Policy at the Edward J. Bloustein School of Planning and Public Policy, Rutgers, the State University of New Jersey. He is also a member of the faculty of Rutgers University.

DR. FELDER: Good afternoon.

What I thought I would do is just

spend five minutes and then see if there are questions that you would like me to address. And then I have a list, whether there are or not, I have a list of questions that I would like to respond to, kind of raise the, quote, energy level in the room and maybe really pinpoint some of this stuff.

Let me just spend two minutes on the Center for Energy, Economic & Environmental Policy. As the name suggests, we really think we should link these three things that you have heard today.

Some of the stuff we've been doing for the State. We do a lot of state-sponsored research, but primarily for the Board of Public Utility, that I'm spending more and more time interacting with, the New Jersey DEP colleagues or counterparts. As Mike Winka mentioned this morning, we do participate in the evaluation of the New Jersey Clean Energy Program, but on the renewable side; on the energy efficiency side, we've been doing that for four or five years. So we both do direct evaluation work for ourselves, but we also manage outside experts and consultants and advise that process.

As Mike Winka also mentioned, we are doing the modeling and the data analysis for the New Jersey Energy Master Plan, which is a process I started a little bit before the inventory of greenhouse gases initiated Executive Order No. 54, but obviously those two efforts are very coordinated and, as I mentioned, I now spend a good part of my day talking to DEP and BPU folks and every once in a while, DOT.

We also have created a New Jersey energy data center that goes hand in hand with the energy master plan so that we have the metrics in terms of energy distributed emissions, prices, uses, on and on and on; that way the public and also experts can have a common consistent force of data so that they can do analyses, program evaluation and all that good stuff. So that's in a prototype phase that's under review and it will also be made publicly available.

We also run the New Jersey Hydrogen Learning Center. I should have mentioned, I didn't provide on the outline, that a couple of years ago we did a really good small report on RGGI emission allowances, which is a topic I do want to come back to in my short time because it illustrates one of my major themes.

Primarily, we've been talking about greenhouse gas emissions. So the question is: How do we decrease the emission of carbon, while increasing our economic growth?

I think it's somewhat of a simplistic question. We oversimplify it. At the end of the day, that's what we're trying to do.

The good news is we can have both economic prosperity, economic growth and address our greenhouse gas concern; in other words, meet the government's targets in 2020 and potentially in 2050, which are very ambitious. So there is no trade-off between greenhouse gases and economic prosperity. It is not one or the other.

Now, that doesn't mean it is an easy problem. It doesn't mean there are a lot of bad answers out there; that doesn't mean we don't have to think very hard in order to get to that path or continue on that path.

Fundamentally, I believe strongly and our modeling suggests, both ours and numerous other sources, you can do both so I guess that's good news.

Obviously, this is a really complex problem. And I want to provide somewhat of a simple, perhaps simplistic solution to it, but I think it's very important because it really goes to one of my themes here; which is, if you want to increase economic growth, you reduce the cost of economic growth, if you want to decrease the use of carbon or the emission of carbon, you increase on the margin the cost of carbon. If you do those two things, then we can steer this mighty battleship of our economy, the state and national economy, you know, away from a carbon economy to a less carbon-intense economy.

That's very easy for me to say, increase costs here, decrease costs there; obviously, there are political realities.

Here are my quick summaries and

then I want to open up for questions. And depending on the questions, I would like to address some answers to issues people have raised -- or questions you guys have raised.

So number one is we can have both economic prosperity and economic growth, environmental improvements, we can do both.

Secondly, in order to do this, we need a broad-based response, not to quibble with the title of today's hearing, but there is a major sector of the economy, industrial business, you know, commercial sector of the economy that needs to be brought into that. I will talk about that. We really need to design policies with the proper incentives. It's just not enough to say we need energy efficiency.

Energy efficiency designed wrong can actually make things not as good as you thought they were, but perhaps even worse. I will talk about some examples.

So it's not good enough to say energy efficiency is a resource. We need to have long-term solutions that monitor us. We have got to design it right. If we don't design it right we're just spinning our wheels and that won't get us to our two goals of economic growth and reduction of carbon.

Now, of course, if you reduce

carbon, as others have pointed out, you solve a lot of other air emissions problems, as well and perhaps, potentially, some national security issues.

Thirdly, energy, economic and environmental policy must be coordinated and connected. We just can't do energy policy over here, environmental policy over there and economic policy somewhere else. It has to be integrated and the incentives and the issues have to be thought out across all three sectors.

Finally, there are some real issues with energy efficiency. Now, don't go, Oh, my God, this guy doesn't believe in energy efficiency; that's not correct. Energy efficiency is a great, quote, resource. It's certainly a great tool to achieve many of our means, but we need to do it properly.

With that, I realize I was a little bit fast, but I thought I would see if there were any questions regarding the energy master plan, regarding energy efficiency or I can go in and respond to some questions that you guys have asked others. Let me see if there are any questions.

CHAIRMAN BLANDO: Well, I do have -- this is Jim Blando. I have one question.

You just mentioned that there are some examples where improperly decided energy efficient programs have actually been detrimental. I wonder if you could give some of those examples to give us a better appreciation of the need to design them properly.

DR. FELDER: For example, if you give someone a rebate to install a more efficient air conditioner, they take that more efficient air conditioner. So instead of buying a new model, they buy the new energy efficiency model. What has happened, on the margin, the cost for them to cool their house, once they now have this new air conditioner, is less. So they'll do several things, one is their energy bill has now gone down so they now have some extra income, they will spend that money and perhaps they spend it driving their car further, which may have more CO2 emissions than the savings of energy efficiency in terms of the air conditioner.

Secondly, instead of keeping their house at 71 or 70 degrees, because it now costs less, they now can keep it one degree cooler than they otherwise would.

So what's important, what the key idea here is, it is important to raise the cost on the margin of emitting whatever emission you're trying to reduce, whether it's SO_2, NO_x, or CO_2.

Here's another example, RGGI, which is the Regional Greenhouse Gas Initiative, caps the amount of emissions, but just for generation units, power plants over 25 megawatts.

What the cap does is it raises the cost of emitting CO_2 because you have to go out and buy an emission permit, which is a good thing, because on the margin, it directs economic activity away from carbon consumption, carbon emission, and directs it towards noncarbon or less carbon-emission items.

Now, if the policies aren't designed right and people now connect a Honda generator, you know, a 5 kilowatt or small kilowatt Honda generator, that's emitting more CO_2 than if they would have bought it from the grid. You've now created a bigger problem.

So we need to think through these incentives, not only within the behavior of a particular person, but through that industry and then the connection to other energy sectors.

MR. HANNA: My name is Toby Hanna. I heard the term, like, the jargon, "decoupling," twice today.

The more I sit here and think about it, I see the kind of a catch-22 it is, that you don't want to have the utility providers offering volume discounts for energy consumption, whether it's natural gas or fuel oil or electric. But at the same time, you want the user of the energy to be able to get some payback from their reduction, from their energy efficiency or conservation.

How do we balance that?

DR. FELDER: A lot is embedded in the word "coupling." I'm a former nuclear engineer. When you redefine energy efficiency to include nuclear power, that was just a great sleight of hand. So words matter. There is a whole vector of what decoupling means. So what decoupling has meant in the past or what people have attached that label to matters immensely.

I think decoupling, and I think even the advocates would agree, without too many beers in them, that, at best, decoupling removes a perverse incentive, which is the throughput incentive, if done rightly. That being said, there may be other -- that -- you know, decoupling alone is a necessary but not sufficient condition to get you towards the energy efficiency that I think many of us in this room are imagining, so it really matters on the details.

The way it is done can effect the relative risk between what the utility pays and what the consumer pays, because a lot of utility revenue is temperature dependant. If you have a hot summer, electric utilities do better; and in cold weather, natural gas. How you design that coupling may shift that risk that historically was put on the utility, but now comes on the consumer.

So in this type of discussion, unfortunately, unless we sit down and really define decoupling and think through carefully the economic incentive on the fuel side and on the utility side and implant it with all the other policies and stuff going around, it's hard to say, I wish I could, you know, say what the result would be.

Does that answer your question?

MR. HANNA: I think it highlights the concern, yes. If --

DR. FELDER: I mean, if it's done wrongly, it's no better or worse. If done properly, I think they can tell it's part of the package.

MR. MC NEIL: I'm with the Weequahic Park Association in Newark, and we're 1 mile west of Newark International Airport and the Port Authority of New York and New Jersey.

We have a serious environmental

problem, I know I came down here for the energy program and I'm glad you're here because you do that kind of research, but I'm sure based on EPA reports, that's a highly --

particulates from the planes, from the ships, from Highway 27, Route 22, Route 1, Route 9, we're inundated. And the people in our community are seriously interested in the energy savings programs, but they won't be around because of those particulates.

I have a chart here showing that more people die from those particulates in that area over New Jersey, than from homicides or auto accidents. And I'm sure there are no recent or current studies done around Newark Airport on a study basis to let the community know what's killing them.

DR. FELDER: This is a great point and it qualifies a point that five or six speakers ago made. If you weren't here, sir, she said, Look, if you reduce CO2, you'll help with these other emissions. That's true in general, but it may not help or help as much in point sources on particular days, you know, that hot summer day where there is, you know, many airplanes and so forth. So that is an issue that's incredibly important that may not be caught up if you have a successful CO_2 reduction policy.

Moreover, it really hits that interaction between all the transportation that you ticked off, you listed electricity, power plants and usage so -- and that may be more appropriate for DEP staff in terms of the particulars.

CHAIRMAN BLANDO: Well, let me, if I may, you know, just to get back to some of the issues that you're hitting on, in terms of policy, so you're clearly highlighting some of the challenges and some of the subtleties of having an effective policy, some of the pitfalls of various policies, but for example, we have all and I know I myself have been very curious about, for example, with some of the rebate issues that you talked about with some of the appliances, for example, that you give people a rebate and then they just lower the thermostat and therefore you don't really decrease the energy being used.

What is a solution to some of

those pitfalls; I mean, is there a solution or is it just recognized as a problem that we don't know what to do?

DR. FELDER: I think there are

various solutions. If you are in the rebate-type framework, you adjust this type of rebate. You try to provide incentive. You do measurement and verification.

What Mike Winka laid out from the Board of Public Utility, was this notion, I don't know if he used this term, "white tags" where you have the energy efficiency portfolio standards; that solves the incentive problem because for every time you use a kilowatt hour of electricity, you get so much energy efficiency.

So on the margin, this is the key, on the margin it raises the cost of using electricity. So when I implement a more efficient air conditioner, if I then turn around and spend it by keeping the lights on or don't worry about turning off the computers or whatever, I then have to go out and get the corresponding amount of energy efficiency for that increasing use, so that provides that incentive on the margin.

The problem is if I then take that money that I save and say, Well, I've saved $300 a year on my electricity bill, I'm going to upgrade my Ford pickup truck to the super Ford pickup truck or whatever, and now I'm emitting it on the transportation side, which is why it's critical -- and I think New Jersey is trying to get there with it's energy master plan -- be comprehensive over all the energy uses, otherwise the programs just won't be as effective as we anticipate.

Now, the deeper point, I think -- and I'm not an economist, so I don't want to speak with the passion of a convert, but with the reason of somebody who has found this tool very useful -- is that we need to apply a rigorous economic analysis and understand people's incentive.

Let me give you another example. I think a person a little bit before lunch raised this issue that RGGI emission allowances should be allocated in part or some share to generation companies based on their ongoing production; in other words, the more you produce, the more RGGI allowances you get.

Well, what is that?

That's a frequent flier mileage program to produce CO_2. You produce and you keep your coal plant running and you get more allowances. Allowances are the equivalent of dollar bills because you just sell them in the market or you take the economic value of it.

So I'm not saying that's a good or bad idea, but unless you trace through those economic incentives, which we did in a small RGGI report, what seems to be a really good idea, Oh, yeah, we should give allowances to generation manufacturers because they'll go out and pursue energy efficiency -- if you trace through economics, which requires a couple of hours. I'm not talking about a three-year academic seminar, although I'm all for that kind of thorough understanding. And I've done it with stakeholders. You can then see, Oh, my God, they have the "a-hah moment"; this is actually counterproductive, what we thought would result in A is resulting in Z.

Now, there are other examples. Take the renewable portfolio standard, which requires a minimum amount of renewable energy, solar and other types, class 1, class 2. When you marry that with a cap and trade program for sulfur dioxide or for carbon dioxide, one is you can't add the benefits, you can't take CO2 reductions from energy efficiency, plus the CO2 reductions due to solar and wind and add them to RGGI and get a cumulative effect.

Why?

By increasing energy efficiency or reducing energy demand, you free up allowances on the electricity side, which will then be sold to some other state in the region, to a pole plant or natural gas plant, who will then emit it. So you need to not only get the energy efficiency policies right, but implant them properly in the other policies that we have; otherwise, the benefits won't be as much as we would like.

CHAIRMAN BLANDO: So are you implying that the trade component of cap and trade programs would not be productive or effective?

DR. FELDER: No, no. I really like cap and trade programs, but I'm just saying that you can't just say an energy efficiency rebate program, that saves 1 ton of CO_2, plus RGGI that saves 2 tons of CO_2, and when you put them together, you save three tons; that's not necessarily the case. You've got to get an understanding of the incentives, how those two programs interact. It could be that you just saved 2 tons of CO_2, the one saving from energy efficiency frees up an allowance for somebody to use and buy some of the market.

And I'm not trying to overcomplicate or have a full-time federal employment act, but we have got a lot of stuff to do if we're planning to meet these goals and that's for someone else to decide. And unless we align these policies up, the economic incentives and then between them, we'll just be, you know, shooting ourselves in the foot to -- or really reducing the effectiveness of what the outcome is.

Other questions?

CHAIRMAN BLANDO: Jim Blando.

One concern that I've heard raised by some of the more traditional power producers regarding alternate energy sources is the reliability issue.

DR. FELDER: Yes.

CHAIRMAN BLANDO: And I've

constantly seen in California, it's cited that during one of their rolling blackouts, or something, that their total wind power production was only 4 percent of capacity because it just happened that the wind wasn't blowing that day.

I am just curious as to how the reliability issue factors into renewable and alternative energy sources. I was wondering if you could comment on that.

DR. FELDER: Absolutely. This is one of my areas of -- or major areas of expertise for a while.

Different resources, energy efficiency, wind, coal, nuclear power, whatever, have different benefits and costs. And on the reliability side, obviously, wind and solar are intermittent. Now, on peak demand days, you get less of wind, that's why it's hot out, if the wind is not blowing, but you get a lot of solar. The solar is located typically at the source of consumption, at the load. So if you design it right, if there is a blackout and that's why the gentleman from the Governor's office is attaching solar to police facilities or emergency facilities, because it makes sense, there may be a blackout, but you want those facilities to remain up an running.

On the wind side, a rough, rough, rough rule of thumb is about 15 to 20 percent of a power system shouldn't be wind. I mean, that's kind of the upper limit. It depends on many, many details and the specifics of the power system.

For example, Pennsylvania, Jersey, Maryland power pool, the PJM power system, they do their studies to associate or calculate the appropriate capacity value of wind relative to other resources. So it's a problem. It can be managed. You don't need to think outside the box. People are dealing with it on a daily basis today.

So I would not assign the cause of the California blackouts to wind generation. There were many problems that were there before that, that's probably too long to go into.

Moreover, the most recent blackout in 2003 wasn't due to renewables. We've had blackouts way before renewables, 1965 and there is a long history; that doesn't mean that this is an issue that can't be managed or that there aren't any concerns, they just need to be identified and addressed in a reasonable way.

CHAIRMAN BLANDO: I think we have time for one more question from council members.

DR. FELDER: Can I ask myself a question and I'll be done?

A long, long time ago, in a land far away is the public's willingness to act. And please don't get me wrong. I think there should be education. I think there should be public involvement. I think there should be leadership. I believe in all those things. Please don't get me wrong. But if we're going to substantially shift our economy away from carbon dioxide and reduce that anywhere near what New Jersey or other states have laid out or what I think many people believe we need to do, we need to use price signals in order to do that. Voluntary action is admirable and incredibly important. I'm not dismissing it at all, but it won't get us there. It won't get us anywhere near, I think, the goals that Governor Corzine has laid out.

That being said, we can do it without bankrupting our economy and we can still grow our economy and achieve those greenhouse gas and other emission goals.

Thank you very much for your time.

CHAIRMAN BLANDO: Our next speaker, our last invited speaker today is William Walsh, Director of Corporate Issues, PSE&G.

William.

MR. WALSH: Good afternoon, and thanks for the opportunity to present our views, some utility views, some individual company views.

I think Frank found the solution, though, any good way to build a coalition apparently starts with beer, at least, from a decoupling standpoint so I'd be happy to participate in those discussions.

I have a packet of information for you. I'm going to walk through some of those pieces and I'm going to bounce around. I have a sense you've been here for a long time. I'll try to move it quickly and try not to repeat what I've heard.

I've heard a lot about master plans today. Electric and gas utilities have been very active participants in this. The Governor has clearly set some very aggressive goals. They really represent a substantial challenge, but when you really think of those in the context of climate issues, energy costs, the security and the reliability of energy supplies, I think we really need to look at that now. Now, is the time to take that challenge. It will require a fundamental change in the way we look at our electric and gas utilities and the role that you all play going forward.

How much are we really talking about when we talk about 20 percent reduction due to efficiency and 20 percent reduction due to renewables?

We're talking about the combined electric consumption of the States of Connecticut and Rhode Island for the year 2004, a huge amount of energy. But before we throw our hands up and say, We can't get there from here, if you look at the example of what's happened to the energy consumption of an 18 cubic foot refrigerator in 1970 that burned about 2,000 kilowatt hours a year, today, it's less than one-fifth of that if you buy an Energy Star refrigerator. So the changes and advances in efficiency are there. I think we need to continue to apply those kind of rules and that kind of thinking to continue.

The electric and gas utility community has contributed something more than 20 ideas throughout the master plan process. They go from the range of advanced metering infrastructure or metering your equipment, which can kind of set the stage for measurements and verification, that I heard Frank talk about, and some of these other issues we need to have going forward, energy efficient management.

A number of these strategies have some broad support within the electric and gas community, some don't. Some are one company coming up with an idea that other companies may not agree with initially. But quite frankly, it represents a very broad spectrum for policy makers and those who will make recommendations to policy makers, like the Council. It gives you a sense of some of the new thinking that is out there.

My company, PSE&G, is not new to this area. We were the first utility in the country to sign off to a voluntary agreement to reduce our greenhouse gases to 1990 levels by the year 2000. We accomplished that. We are currently taking that to the next step, which is to reduce the CO_2 emission rates by 18 percent by the year 2008 from 2000 levels. We are well on track to do that. We've been in support of national legislation that would reduce the electric power emission to 1990 levels.

How much are we really talking about when we say we want to reduce those levels, CO_2 and greenhouse gases to 1990 by the year 2020?

Assuming that the current amount of New Jersey's emissions are around 150 metric tons or million metric tons, excuse me, and on a business-as-usual course we would expect that to grow to somewhere around 180 million tons by the year 2020, we're talking about a 25 percent reduction. And a recent McKinsey & Associates study on global abatement suggests that in order to get a 25 percent reduction, you're looking at a carbon cost of somewhere between $15 and $30 a ton.

If you assume we get there on a gradual course through 2020, we're talking about the potential impact of the New Jersey economy somewhere between $3 billion and $6 billion. And if New Jersey or even RGGI is going to undertake that program without having participation from other states, and quite frankly, countrywide, then it clearly will potentially have a significant negative impact on the New Jersey economy.

I think that there are things that New Jersey's utilities can do right now to address this issue that won't put us at an economic disadvantage. I am referring to those 20-some ideas that the seven P&G companies have put forth in the master plan process, the metering initiative, which really lets customers see pricing in a real-time situation, reduce their demand and better control their energy uses and also provide information and education on how to do that.

Incentives for energy efficiency programs, transportation renewables, and I won't speak to the nuclear issue, I think you heard enough of that before, although, we are a significant user of nuclear power here in New Jersey, over 50 percent last year of energy in New Jersey came from nuclear.

We do have some concerns with RGGI, as currently designed. Specifically, if it goes forward as just a regional initiative and we don't have any national program, we're not convinced that we're going to see significant overall emissions because -- I don't know if the term "leakage" was raised before, but the likelihood that power will be produced from states to the west of us in the PJM system and even in the midwest, which have, quite frankly, a dirtier environmental profile than New Jersey's generation is an issue that we need to address.

So somehow we need to come up with

a way to deal with the leakage issue because that will clearly have an impact, not only on our economy, but on our workforces where we have a competitive disadvantage.

And New Jersey's power sector, 23 million tons a year represents something like 15 percent of New Jersey's contribution, New Jersey's total CO_2 emissions. Nationally, the electric power sector is somewhere in the 40 percent range.

And energy and environment, they're inextricably linked. We need in New Jersey an integrated approach that is going to develop an infrastructure to enable energy efficiency, conservation, DSM, as the first choice for consumers, implement renewable supplies wherever they make sense and have a -- ensure a long-term, carbon-friendly central power station source of energy.

I mentioned earlier, the localized

caps -- our concern, they will not produce the effect intended.

Where has PSE&G been on this?

As I said, we have taken a

leadership role in a number of areas, not only education of the public, as well as policy makers, and we've done an awful lot to reduce our own carbon intensity.

Since 1990, we have spent through conversions, through natural gas combined cycle, improved nuclear capacity factor, technological upgrades, we've invested more than $3 billion in our fossil fuel alone; that's since 1990 in New Jersey and elsewhere in the country.

I left with your report called "Benchmarking Air Emissions." This is the fifth in a series of collaborative work between the Coalition for Environmentally Responsible Economies, the Natural Resources Defense Counsel and PSE&G. And it's sort of a report card on the emissions from the top 100 power companies in the country. And I would -- I think that this can actually serve as a valuable resource for policy makers and can help us to really understand the link between energy and the environment.

Certainly increased levels of efficiency by management, you're going to cut your usage, you're clearly going to cut your emissions from power plants. And it's that generating station -- Frank Felder referred to a term "on the margin" -- whatever that station is, that's on the margin that has to produce less energy because you are doing a better job at your home or at your factory in terms of increasing your energy sufficiency; that unit on the margin is what is really going to drive the air climate impact. This report gives us a number of averages and I think in order to really get a sense of the benefits to be obtained, I think we can use this report as a source.

I've got one quick example.

The 100 top generator companies in the country, their average CO2 emission rate was something north of 1300 pounds per megawatt hour for CO2. In a household that consumes around 10 megawatt hours a year, and that's about 830 kilowatt hours a month, for

those of you who watch the bill, you're
talking about carbon emissions slightly over
6.7 tons for your household, assuming you had
-- your source of energy came from the average

of the top 100.

If you look at PSE&G's generating fleet and what our profile looks like, that same household that got its source from the average of PSE&G's generation, you're looking at about 3.5 tons, as opposed to 6 so slightly more than half is our contribution.

So absent having the other 99 companies in the country, that make up the top 100, have a profile that looks like ours, how are we going to reap some of these benefits of reducing carbon?

The utilities I think are uniquely positioned to help invest in those technologies; such as, the ones I mentioned, energy efficiency, land-side management opportunities, renewables. And the metering infrastructure gets to the measuring and verification issues that were raised.

We have been running -- this summer will be the second summer we've run a pilot called "my power connection," where we have thermostats in households linked directly to the air conditioning units and depending on the price of electricity in any one hour, the air conditioning thermostat would be raised 5 degrees or 10 degrees or whatever the customer would preprogram. So we have seen a number of folks see some interesting savings as a result of that.

We only had it in for a couple of months of last summer. We're going to run this program again this year in 2007. We have some high hopes for how that will work.

The other area where I think utilities can really help us is something we call "patient capital." What I mean by that is we have the ability and the utilities have the ability to make long-term investments to serve the public interest.

As long as there is some assurance that we will get a reasonable return of the dollars we invest and a reasonable return on that investment, I think you'll find the utility community is more than happy to participate to help maximize the penetrations for efficiency, PSM, renewables, as well.

We think this formula will also work for renewables. PSE&G has been working with a number of solar interests. We are developing a strategy where we think we can max or increase the penetration of solar, at least, within the PSE&G territory to get over some of the hurdles with respect to the ability to get long-term funding, ability to get the banks, a level interest, find an equity partner.

We're working with a number of constituencies to come up with a program. We are vetting that as we speak. And I think we're going to come up with something that will really increase the penetration of solar and not restrict it to those upper, middle and high-income households, who can really afford it at this point.

I will be candid. They are significantly more expensive than conventional sources. I don't think that comes as a surprise to anybody here in this room.

RGGI, for a minute, if I could spend just a second on that. PSE&G signed onto that in an effort to get some national movement. I think we're starting to see that. There are probably four or five bills in Congress introduced now.

We do have concerns that if a single state or a region even, the RGGI region as comprised now, goes ahead and with the likelihood that we may have a national program in two to three years, we are concerned about what happens when that national program kicks in; will we be able to dovetail national programs into -- or will the New Jersey or RGGI program dovetail easily into a national program; that's really what we need in order to address the leakage issues and really make some significant dent into what is expected to be the increase in carbon.

And why that is important, if you could just bear with me for a second, if you have that report handy, and I have it in my remarks, as well, on page 14, I mention that the New Jersey contribution from electric power sectors is about 23 million tons of carbon.

If you look at this, page 14 has a

map of the United States. And as of January of last year, there were 132 new coal plants on the books for construction in the country. Forty-seven of them are within the PJM power pool area. One of them was in the RGGI region.

Now, the power information administration suspects that by the year 2030, electricity produced from coal will increase by 1.3 billion kilowatt hours, resulting in 1.1 billion tons, annually, of additional carbon.

We're talking about something that's a level of carbon, if these 132 were built, that is 6 times the 2009 RGGI state budget. Put another way, shut down every source in the RGGI region for six years in order to offset the contribution that's expected from these additional coal plants.

So the point here really is: New Jersey can't do it alone. RGGI can't do it alone. We really need to get behind the national program so that all these sources will be treated equally.

I had in the packet -- I heard the

imports mentioned before so this may come in handy. This shows what New Jersey's consumption has been and the source of that since 1990 up to 2005. The tall thin gray bar in the center actually represents our total electric usage with the other stack bars representing the source.

Now, the difference between the thin gray bar in the middle and the highest blue bar represents the imports. And over this period from 1990 to 2005, we're looking at somewhere between 17 and 36 percent of imports.

The RGGI issue and how it may have significantly higher impacts to New Jersey, really, I think we can see from the second chart, which sort of looks like the eastern third of the country -- I hope the colors are, at least, trying to keep some folks awake. I know it's kind of tough. You've been here all day. I appreciate your patience. But this is why it's important to New Jersey. The red area represents the PJM control area; that's the power pool that we operate in. The sort of lighter green area is showing New Jersey, Delaware and Maryland. We're on the eastern edge of PJM. We are in the RGGI states. But we operate within the PJM power pool, which is 12 states plus D.C. And you can see from the red how far that reach goes.

New York, a RGGI state, is its own separate power pool. The rest of the New England states are within their own New England power pool. So we have a situation where New Jersey has signed on to a program that impacts not all the generators in the power pool that we operate in and therein lies the issue and the concern. Even RGGI modeling by RGGI staff shows that the level of imports will likely rise, sometimes significantly in some of the models that they've done. This gets to the issue of leakage and how we can possibly deal with that.

One other issue relative to cap and trade programs.

PSE&G has been involved in the development and the implementation of programs for NOx, SO2, and CO2, as well. If there is a lesson that I could offer the Council with respect to our experience, it is: Who is going to pay the cost of that?

Well, the electric generators are clearly going to price into their bid for power what it costs them to control these various pollutants and depending on the structure of that electricity market, some or all of that will be passed on to consumers in the form of higher wholesale electric prices.

There is a number of ways we can deal with that. We talked about auctioning allowances. I heard that earlier. Returning proceeds to customers in the form of rebates or energy efficiency programs or even in reduced taxes. Economists, I think, will tell you that that's probably the preferred, most efficient way to do that, at least, that's what the theory suggests. As a matter of public policy, I don't know how the United States gets rid of coal-fired power plants. They're going to continue to be an important source. 70 percent of the fossil fuels or 70 percent of the energy was produced by fossil fuels in this country in 2004, 50 percent from coal.

If you look at New Jersey's numbers for 2004, we had 14 percent in New Jersey, coal related.

A case in point is an investment

that we have to look at right now for a coal plant we have in northern New Jersey. We're looking at a $600 million to $700 million investment to put back-end control technologies on.

And as you know, the northeast is going towards a cap and trade program through RGGI. Some states are talking about 100 percent auction of the allowances, I think Frank mentioned that. I think RGGI says 25 percent minimum, but New York and some others are considering a 100 percent auction.

When we look at the analysis of this investment and the assumptions we know about, the forward electric prices, natural gas prices, energy markets and pricing on CO_2 allowances, our financial analysis of this investment shows that for every 10 percent you increase the auction, it has a negative $15 million net present value effect on the decision we need to make. So at 100 percent, it makes it a very questionable decision as to whether or not we make that investment. And, therefore, has a direct bearing on whether or not we continue to operate the facility.

You know, the closure of this facility doesn't improve New Jersey's air quality because more than likely, as I showed earlier, I think we're going to see those kilowatt hours coming in from Pennsylvania or further to the west. Again, with an environmental profile that is significantly dirtier than New Jersey's -- New Jersey's own.

So it's certainly not going to help us with global warming issues. It will potentially negatively impact reliability and pricing and so without a viable leakage method or mechanism rather, a viable method contained leakage, we're going to see that upland power coming across. Many of those plants are coal and, to us, that doesn't necessarily make sense.

We need to be assured that the leadership or the price paid for being the leader on prime issues, like New Jersey is, is not going to translate to some economic incentive for upland states and dirtier power that is going to penalize New Jersey's economy; thereby, possibly negatively impacting operating jobs at New Jersey's plants, generation plants, and also negating a number of construction jobs associated with whatever upgrades would be made at New Jersey facilities.

Now, I do have to point out, when we made this economic analysis, we did not assume that any of the CO2 allowances would be grandfathered to us. We assumed that in order to get these, we need to be running. That's why I think there was a significant difference of what we saw at SO2 programs, where you were grandfathered in SO2 programs, so if you decide to shut your plant down two days later, you still have the allowances to sell on the open market.

We're assuming that that does not happen here, that if you don't run, you don't get allowances, whether they're for auction or there's somehow a price determined or in some way they're allocated.

So our suggestion, and this is a

suggestion Ralph Izzo, our CEO, made to Congress a couple of weeks ago when he appeared before the House Committee, that maybe you start at 25 percent like RGGI suggested as the minimum, start there and then over time, maybe ten years, maybe more, maybe less, but gradually increase to 100 percent, gradually work into it rather than start at 100 percent.

If the committee has not seen the work of Dr. Sokolow of Princeton in the carbon mitigation initiative, I would point you to that.

He has some very interesting, I guess I'll call it theories. I have a couple of charts in here and a cite so you can get in touch with the doctor and he can talk you through them because it talks about finding ways to essentially mitigate the expected growth in carbon over the next 50 years or so or starting in 2004. We are looking at possibly doubling. So he has developed a number of strategies. And everything we are talking about today, energy efficiency, electricity, low-carbon displacement, low-carbon fuels, they're all in here. So I would point the Council to that and I think I'm about, I'm about finished here.

I heard the phrase, no magic

bullet. There is no silver bullet here, either. I don't think there are any bullets here. I think I've given some ideas on how utilities can help with the first two pieces, efficiency and the demand-type management. But really, from an electric industry standpoint, it is an essential task for our company and for the state policy makers to maintain the reliability of the system. We're going to require a new electric base load in the State of New Jersey and there are a number of issues to be considered and I think you heard some of them before.

We've got a number of pilots, one to the U.S. Department of Energy on carbon capture, carbon sequestration, storage technologies, combined-cycle operations. There is nothing available yet as a technology for back-end fits for carbon.

Now, the research is there and the research needs to continue. So from a developer's standpoint, investing in an IGC plan at this point is very shaky because you don't know what's going to happen. You don't know if -- first of all, you can't get a good handle yet on the cost of that infrastructure. There are a number of risks that are presented to merge the suppliers associated with this.

While one nuclear commercial will be, it is carbon free, but it's not without issues. Let's face it, there are siting issues. We still have the unresolved issue of spent fuel and there is an extremely long licensing and construction lead time associated with nuclear. These are all issues we need to address; but despite these risks, it still appears to be the most, at least, I guess, the best at this point option, a realistic option, for production without CO2. I think we need to address those uncertainties while we continue the R&D into carbon capture and carbon sequestration and storage.

With that, I would like to thank you for your attention.

I appreciate being -- everybody's attention considering I'm last on the agenda

here before we start the next phase and I
would be happy to address any questions you
have.
CHAIRMAN BLANDO: Sure.

Michael.

MR. EGENTON: Michael Egenton.

Bill, considering those challenges that the Governor has laid out in the greenhouse gas executive order and the energy master plan that I know your company is working on, the statistic that is thrown out there consistently is that a million more people are going to move here to the State of New Jersey in the next decade.

Has PSE&G calculated that in meeting those energy demands on top of what, you know, we spent the day on, meeting the challenges of what the Governor has set forth here for us for the State of New Jersey?

MR. WALSH: I think, Michael, I guess the popular expectation is that energy needs, absent any intervention from a master plan, would grow on the order of a percent and a half a year through 2020. So if you look at where the state was in 2005, 2004, about

80,000 gigawatt hours. So business as usual takes you out to about 100,000 gigawatt hours or 20 percent, 25 percent growth by 2020. So the impact of the master plan through the efficiency and the demand-side management and conservation initiative would be to wipe out that 20,000 gigawatt hour growth by 2020.

Additionally, the expectation is that the renewables would then lower that another 20 percent if you have the right incentives in place and you have enough rules for solar and all of the other renewable options that are out there.

MR. EGENTON: Is that renewable portfolio though -- my concern, I guess, would be can solar and wind truly meet that demand alone?

We heard about nuclear today. We know about liquefied natural gas and other sources of energy.

Does that fit into the portfolio or are we just saying, you know, certain specific areas?

MR. WALSH: No, no. I think everything fits into the portfolio.

What we're suggesting is that number one, you look at efficiency, conservation, demand-side management as the first option. Then you need to look at renewables where they make sense. And then, third, you have to have a solid base of central-station power because it's not going to go away.

You know, I saw an article in the paper yesterday about a press conference that was held where folks were saying we ought to shut down Oyster Creek and Salem 1 and 2, and coal is no good either.

MR. EGENTON: Let me throw this out there.

If those two facilities were to shut down what kind of impact would that have on the State energy demands.

MR. WALSH: Total nuclear production from the State last year was slightly over 51 percent, so it would have to come from somewhere. Now, that does not take into account, assuming that there were no congestion issues with delivering power and assuming we had the import capability to get that power here on a sustained basis, big assumptions. And clearly, I think we don't. There are a number of transmission options that are out there, folks from the -- further west and the southwest are looking at building transmission lines into New Jersey. The source of a lot of that generation would more than likely be coal to sell into the most expensive market into the country, absent California, which is the northeast.

MR. ZONIS: I'm Irwin Zonis. My home is in Essex County I'm a PSE&G customer.

A few months back, PSE&G in its monthly billing offered a couple of packages to improve one's efficiency at home, both were relatively inexpensive. One was less than $5, one less than $10; that included low-flow nozzles for you bathroom sink, weather stripping and a few other devices.

I thought the $10 was not a bad deal and I bought it. In fact, I've installed some of that equipment. But the purpose of my question is this was a very low-key offer. It was fine printed on a little card that comes in the envelope with the rest of the bill.

Do you have any idea, did Public Service get some reasonable response to that; did they sell any of those units; did you notice a one-hundredth of one percent decrease in the use of power in the following month?

The purpose of my question is that we've been talking about education and public knowledge, public understanding and all this. Certainly, there were not black skulls an skeletons surrounding the notice I received from Public Service that you were going to flood the southern end of the State of New Jersey unless you put this stuff in your house, but it was about as low-key as it could possibly be. I wonder what kind of response Public Service got to that offer.

MR. WALSH: That I don't have off the top of my head. I know there were two kits available. There was a $5 and $10 kit, if I remember.

MR. ZONIS: Yes.

MR. WALSH: I will try to get that number and then through the Council have it distributed to the members. Clearly, that was a $75 or $80 value, that kit.

MR. ZONIS: I didn't try to price it out, but it occurred to me that what I got was certainly worth more than ten bucks.

MR. WALSH: The balance of that

essentially comes from the Clean Energy Program, that we all pay in our bills monthly.

MR. ZONIS: I figure the shower head alone was probably more than the $10.

MR. WALSH: That's a fair assumption. I apologize. I don't have that number off the top of my head.

MR. ZONIS: Not a problem. My question was: Is there enough money in the fund so that you could have written in the PSE&G bill that those who didn't have a spare ten bucks in their pocket could send in this card and get it for free?

MR. WALSH: I don't know. I don't know if there was one specific to that. There are a number of state-sponsored programs and low-income, energy-assistance programs out there, but whether they're focused specifically on that kit, I would say probably not, but I don't know.

MR. ZONIS: The $10 probably paid

for the handling and shipping costs and very little more than that.

MR. WALSH: I'm sorry, but I don't have the answer. I'll get it for you.

CHAIRMAN BLANDO: One last question.

You mentioned you had a lot of discussion on the issue of leakage under RGGI and a few other initiatives.

Are there any proposed solutions out there; can something be done?

MR. WALSH: I think there are a number of solutions. I guess there a number that are out there on the plate.

Certainly, we are very much aware of the issue and looking for ways to address it. Whether -- I have heard ideas of, I guess, an environmental portfolio standard like we have one for the renewable portfolio standards, where everybody would, essentially, if you're going to sell a kilowatt hour into the State of New Jersey, it has to have a certain profile, you can't exceed X pounds of CO2 or something like that. And I am told that there are ways around the interstate commerce clause issues with respect to that. That's one of a number of ideas that have to be vetted more with stakeholders so that we come up with a solution.

I think the number one solution is a national program. If you impose whatever restrictions on everyone, every power generator, everybody knows what the rules of the game are. There is no uncertainty. People can then go out and say okay, I know what I have to do in the next five years, here are my rules. My rules are not going to change. I can now make an investment decision because I know that side of my equation won't change. I can quantify those risks.

CHAIRMAN BLANDO: Thank you.

MR. WALSH: Thank you very much.

CHAIRMAN BLANDO: Well that ends the list of the invited speakers. We're running just a little bit late. I guess next is the public comment period. We had four speakers that had registered to speak, the first is Latrell McLean, a New Jersey concerned citizen.

MR. MC LEAN: Hello, everyone.

I'm going to be real quick. I know everybody is probably ready to go home. It has been a long day and now you are running a little late.

I just have questions regarding the EPA and a report. I want to talk about three companies that are involved in my life and around me constantly, everyday: The Exxon/Mobil plant in Paulsboro, the Sunoco plant on 295 and the CCMU plant in Camden.

I was just wondering -- I missed the two gentleman that were speaking about the law and the public safety and the public health issues. I was just wondering if anybody on the Council can explain to me, are they going to change the laws of way the plants react in letting the air be polluted?

The CCMU plant in Camden for years has been letting out things in the air and I just don't understand how they can continue to do it and getting these little tiny finds.

The same thing with the Exxon/Mobil company. Last summer, their debris spilled out and came all the way over to my house, coming down to near Woodbury, spilling debris.

Now, these chemicals are going in the air so it's got to be just passing through, but for them to drop that much debris coming from Paulsboro to Woodbury is very disturbing to me. And for them not to even -- for me not to even see what kind of fine was given to them and not even knowing what that debris was that fell out of the air along my property. I just want to know if anybody here can answer those questions for me.

CHAIRMAN BLANDO: Have you discussed your concerns with anybody at the Department of Environmental Protection?

MR. MC LEAN: Yes. They had a meeting they came for a meeting with -- Mobil/Exxon had a meeting, but the CCMU plant in Camden and the Sunoco plant, nobody came. They said they just had a fine. But it is not public knowledge. I would like to know, is it public knowledge to know about their crime and what actually fell down out of the sky?

CHAIRMAN BLANDO: Well, I mean, certainly, the Clean Air Council is an advisory body to the commissioner of the

Department of Environmental Protection. It sounds as though your concerns should be more directly addressed to the actual government agencies; such as, the Department of

Environmental Protection.

I don't know if you, Bill, have any knowledge about the current activity DEP enforcement is having with regard to CCMU or the Exxon/Mobil. I'm not familiar with exactly what you're referring to.

MR. MC LEAN: It's all these plants that are all in South Jersey.

CHAIRMAN BLANDO: Right. I mean, that sounds like a specific issue that DEP enforcement would be potentially dealing with.

MR. O'SULLIVAN: We have your name on the agenda --

MR. MC LEAN: Okay.

MR. O'SULLIVAN: -- and how we can contact you. If you have an e-mail address, that would be good.

I'll ask the enforcement folks -- they don't report to me -- I'm Bill O'Sullivan. I'm the air director here.

I'll ask the enforcement folks

what the situation is. I think the two refineries are actually Sunoco and Valero. The name has changed over the years. And the CCMUA, that's the incinerator, right?

MR. MC LEAN: Correct.

MR. O'SULLIVAN: We are considering additional rules for the refineries that further reduce emissions and there will be some proposed rules coming out about midyear for that.

There is also some consideration of further reductions of NOx, nitrous oxide emissions from the refuse burning plant; so yes, there is some consideration for further emission reductions from those facilities. Rules will be proposed about midyear on the enforcement status. I will have to defer to our enforcement people to get back to you on that.

MR. MC LEAN: I just would like to know, these -- is it public knowledge, like we -- I would really like to know what spilled from the Exxon/Mobil plant because that travelled a long way from Paulsboro to Woodbury.

Is there any public forum that we can come to and say, Hey, what actually spilled on my property; what did I inhale?

MR. O'SULLIVAN: There is a

requirement for companies to report when they have upsets and what happened and what was emitted. Those reports are public information. Again, I'll have to ask the enforcement program to share those with you.

MR. MC LEAN: Okay.

That was just my concern and just wondering if they're going to change the law regarding -- because this really is for everybody. You know how far, if it gets in the air, it will go because that's a pretty far distance from Paulsboro to Woodbury to travel in the air and spill down like that.

Thank you very much.

CHAIRMAN BLANDO: Thank you very much.

Make sure you leave your contact information so that someone can get a hold of you.

Our next public speaker is Susan Ruch.

MS. RUCH: Ruch.

CHAIRMAN BLANDO: Ruch; okay.

Susan, please.

MS. RUCH: So you understand, this

is a book I brought. This is what the front page of it looks like, the American flag, corn and what we can do now. It says, Think inside the bushel now; and, in the future think outside the bushel because there are a lot of things we can do later. We need to do what we can now.

Thank you for letting me come here and talk. My name is Susan Ruch. I am a Jersey girl. I live here in Hightstown.

This past June of 2006, I had listened to Bloomberg radio and there was a thing on oil, The Addiction to Oil, Ethanol an Antidote. It's not a super fix, but it's a start.

From that point, I went on the Internet and in two weeks researched everything I could find. I found out that New Jersey had no ethanol plants and no E85 fuel made from corn or sugar or anything in order that we could have an alternative source to fuel our cars.

So I found out I could go to Kansas City, Missouri. And I got out of my little box, got out of my comfort zone and I flew out there. I spent a week out there and I found out everything I could do to hopefully come back here and help us here. Because transportation, no matter where it is in the United States is our biggest polluter. Our cars put out CO2 everyday.

There was a stat on the Internet -- I could get the exact stuff, where it was located and what scientifics. But the CO2 that comes out of our tailpipe is odorless. You can't see it. It's invisible. But you have 5 pounds of carbon coming out of your tailpipe for every gallon of gasoline you burn. So can you imagine if somebody burned a gallon of gasoline and made it into a solid, it's like throwing a 5-pound bag of sugar out of your window. So if you have a 20-gallon tank, you are throwing 20 5-pound bags of sugar out your window every time you fill up.

So I came back. I was there in Kansas City. And I found a team, SOZO Energy out of Texas, who has been instrumental in building over a billion gallons of ethanol domestically and internationally. They have either worked in an ethanol plant in Nebraska, South Dakota, all over the United States. There is like 111 ethanol plants up right now. We have none here. There is two going up in New York. There is two going up in Pennsylvania.

We're only 1 of 10 states left in the United States that does not have an E85 dispensing pump to put alternative fuel into our flexible fuel vehicles. So I thought to myself, I've lived here all my life and we're facing a lot of challenges now. Our dependence on foreign oil, burning fossil fuel is taking a toll on us. The harsh reality is that our dependence on oil is causing serious problems that directly impact our energy security, our national security, our economic security, as well as our environment security.

We cannot sit idly by and wait to be prepared. The life we know now will drastically change if we do not start on a path to producing renewable energy specifically for our cars and trucks. Gasoline-powered vehicles will be here for many years to come. No matter what kind of other things we do, gasoline is always going to be a fuel for our car. What we can do now is start to reduce what we're doing.

Our addiction to fossil-fueled oil grows more dangerous as we increasingly rely on foreign oil from unstable and terroristic nations that harm us and kill us everyday.

Obstacles are those frightful things you see when you take your eyes off a goal.

I started this last June. I've been working with the State. I've met with senators at the legislative level. I have a meeting coming up with top officials at DEP on air permitting and I -- at the request of Lisa Jackson. I'm working with the master energy plan, transportation committee with Frank Felder and his staff, of seeing how we can reduce -- number one, reduce our consumption of oil, which is petroleum. In New Jersey, our petroleum consumption is 72 percent. So of all the energy, our transportation is taking a lot of gasoline.

Last year, according to the BTC, we consumed over 5.3 billion gallons of gasoline in New Jersey.

Now, I'm sure that's not all of us driving our cars. I drive 500, 600 miles a week. I'm an accountant. I do bookkeeping and accounting for about 25 companies, so I always drive. So I see on the Turnpike one day, I counted the cars and saw their license plates. Out of say every 20 cars, you've got 5 New Yorkers, 5 Pennsylvanians, 5 New Jersey'ians and then you may have Maryland, Delaware, Florida. Everybody is travelling our highways. We've got the most travelled highways and roads in the northeast corridor, so we have everybody consuming gas.

We need to respond to this because high oil prices -- I've already heard this is at the pumps. Gasoline prices are vulnerable. They emit pollutants, carbon monoxide. All this stuff comes out and we're breathing it everyday. Well, we can reduce that. We can do something about it.

When we reach the point where the

world oil-hungry economies are competing for insufficient supplies of energy, oil will become an even stronger magnet for conflict than it already is. And we do love to drive our cars and trucks. There is a lot of ways we can reduce our oil consumption and reduce our greenhouse gases by using domestically produced fuel from our farmer's fields, whether it be corn, whether it be sugar. Down the road five years, it will be switch grass, municipal solid waste. What we have to do is start them up, half now, so we're ready when we can make a switch to the celluloid biomass.

So there are a lot of things we can do. And our weak response to our energy is all the more frustrating, given that alternatives to oil do exist. Oil is important, is the result of industrial and consumption choices of the past.

We now must choose a different path without eliminating oil imports or abandoning our cars. We can offset a significant portion of demand for oil by giving American consumers a real choice of automotive fuel. You can actually have -- in

other states, there is like 1100 of these gas
stations that are offering E10, which we have
now. All our gasoline now was replaced
with -- was replaced with 10 percent ethanol,

so that's also stretching our gasoline. That doesn't give a better -- it gets about a 6 percent reduction on greenhouse gases and petroleum. It just modifies. But we can even do better. So MTBE has been thrown out so now we're getting better.

Now, at other pumps, you have E85, E95. There are cars already in New Jersey, at Willis Honda, for instance, I went down and looked at one. It's called a Honda Fit. It will run on regular gasoline, E85, any blend thereof with up to 100 percent alcohol in it. So there is technology going on everyday.

So we must enter oil's monopoly on the transportation sector which accounts for 60 percent of America's oil consumption. I believe the bio fuels, E85, biodiesel which could be B20 or B100, you have E95 out in the midwest that powers long-haul trucks, you have E diesel, which is a combination of 15 percent ethanol, 80 percent diesel and 5 percent of other things to keep it combined.

We have flexible-fuel vehicles. We have hybrid vehicles. We increased our CAFE standards. We work on hydrogen. We do everything that we possibly can to move away from the extreme dependence on oil and that's why we're over there fighting in Iraq now. We need to do something to bring our men and women home.

If we're going to clean up America's air, we need to start with America's biggest polluter, engine emission. Now, we already have an RPS, renewable portfolio standard, to reduce our energy usage of electricity by producing renewable energy from solar and wind power and that's terrific. We're on a path.

I know we need an RFS, renewable fuel standard, like they do in other states. We just don't have that. So if we don't decide to control our destiny here, someone else will.

So you may ask, so why are you here?

Because I care. If I didn't care,

I wouldn't be here. We've got to do something.

So let's cut to the chase and look at the facts.

In your books, you will see 72 percent of petroleum consumption comes from our transportation sector in New Jersey. According to the BTC, last year we consumed 5.3 billion gallons of gasoline. 52 percent of our CO2 comes out of our cars and trucks; that's consuming gasoline. New Jersey has the most travelled roads and highways in the northeast corridor. According to New Jersey DEP, 40 percent of our pollution comes out of our cars and trucks. New Jersey has over 3300 gasoline stations. Our fuel of choice at the pump is oil and more oil. We don't have any choices. There is over 180,000 gasoline stations across the nation.

On a national scale, 97 percent of our transportation energy is petroleum so the U.S. Department of Energy estimates that 82 percent of carbon monoxide, 43 percent of reactable organic gases and 57 percent of nitrogen oxide in the U.S. cities are emitted from petroleum-based fuel. Transportation underlies our entire modern economy, the cost of oil affects our businesses, our customers and consumers at all levels.

The U.S. Environmental Protection Agency states that gasoline is the largest source of man-made carcinogens. Our oil consumption will increase 44 percent between 2000 and 2025.

The American Lung Association states that transportation is responsible for 55.7 percent of our outdoor pollution, including 77 percent of that being carbon monoxide. So gasoline is mostly carbon by weight. A gallon of gasoline releases 5 to 6 pounds of carbon in the atmosphere. It's like throwing a 5-pound bag of sugar out of your window every time you burn a gallon. Because it comes out of our tailpipes as an invisible gas, most of us are oblivious to it. The CO coming out of our tailpipes from burning gasoline is a greenhouse gas.

Mobile sources of pollution include cars, trucks, buses, construction equipment, lawn and garden equipment, snow mobiles and boats. According to the inventory of air-toxic emissions compiled by EPA, these types of sources contribute over 60 percent of the air toxic emissions in New Jersey. Among these pollutants are potent carcinogens; such as, benzene, buta -- I can't pronounce half these words, formaldehyde and gasoline.

CHAIRMAN BLANDO: Susan, if I may interrupt --

MS. RUCH: Yes.

CHAIRMAN BLANDO: Thank you very much and I think I'm running out of time, but I do have a question for you.

MS. RUCH: Sure.

CHAIRMAN BLANDO: One thing I'm not sure we got a clear answer on earlier. I am curious when we talk about bio fuels, if every car that was in the country, for example, was converted to E85, would we be able to produce enough bio fuel to actually fuel all of those vehicles; and, would we be able to grow enough corn and switch grass and so on to actually produce that new demand that we would have for those bio fuels?

MS. RUCH: Right now the farmers

have already stepped up to the plate.

Last year they planted and harvested over 87 million bushels of corn or acres of corn. This year they're planing

90.5 million.

Now, everybody says about the fuel thing. The corn that you use for ethanol does not go to human people. It feeds livestock. So when you have a bushel of corn, which weighs about 56 pounds, you're getting 3 gallons of fuel for your car, 17 pounds of high-protein animal feed for your animals, which is fed back to the dairy, the beef cattle, swine, pigs and hogs, which is higher protein than them just eating regular corn. And then you capture the CO2 and you sell it back to beverage companies to put in their soda. They clean it and put it in there.

So everything -- there is always co-products from that. The positive net energy from making ethanol from corn is 1.67, so it's 67 percent positive energy. Down the road it will be better.

Now, switch grass doesn't require a lot, but the technology is not here. To

build the cellulostic ethanol plant right now,
it costs about $300 million. To build a
corn-based ethanol plant costs about
$100 million, so you've got 300 and 100, so

you start with what you know now. I have a contact in Minnesota. I can get as much corn as I want. They only use 12 percent of their corn, so I can get 50 million bushels here. If we use our local corn guys, they plant --

CHAIRMAN BLANDO: So would you say your answer is yes to my question?

MS. RUCH: Yes. We have enough to get it all done.

CHAIRMAN BLANDO: Thank you, very much. I appreciate it.

MS. RUCH: And in your sheet, you will see a thing of all the FFEs that are actually on our highways right now. In five states here, between New York, Delaware, Pennsylvania, Maryland, we have over 700,000 cars that travel our roads right on the east coast that can use flexible fuel right now. They can use E85. So there is a lot of stuff that we can learn.

CHAIRMAN BLANDO: Thank you. And

thank you for the copy of the written material.

Our next speaker is Joanna Underwood from Energy Vision, New York.

Is Joanna here?

MS. UNDERWOOD: I am. I am amazed that anyone's here. It's late in the day. This is what I call state dedication to change. I think it's great, frankly, I must say, to hear someone get up who is a citizen, who got concerned about a problem, who has gone out to find -- try and find a solution, and then, has brought it to you, I think we need a lot of citizens doing that because it really expresses the energy behind a movement in which we've been talking about some of these issues for two decades and we're still talking about them.

I am the president of Energy Vision in New York. Our organization was started just this year to look at ways to end this country's addiction to oil and transportation for all the reasons that have been discussed by the previous speaker.

I am very deeply happy about

bringing the research that I have done on alternate-fuel vehicles and on advanced vehicle technologies here. I have a lot of roots in New Jersey. I got married here. I spent my life getting healthy eating at Terhune Orchards. I lived a block from Pam Mount. I am sorry she's left. And I spent ten years when I was president of an organization called Inform, working in this state to shape and pass the pollution prevention law based on the research that Inform had done on chemical plants showing that there was a solution in preventative action which produced, also, the 1990 pollution prevention law, which was the first prevention law in the country.

I'm here to talk about another solution to the problem that Energy Vision is looking at and that's in the transportation sector. I'd like to talk about how we see this solution and then I'd like to talk about, just for a few minutes, the policy approaches for making it happen.

I will say, as I mentioned, my background in talking about the transportation sector comes from 15 years of researching and writing over a dozen books on the fuels and vehicles of the future, published by Inform and pursuing that work now at Energy Vision.

The aspect that I'm going to talk about, because your concern is greenhouse gases and air pollution here, is the aspect of transportation that generates the most of the health-threatening emissions from vehicles and that is a very significant source in greenhouse gas production; that is, diesel vehicles, diesel buses and trucks and produce delivery vans.

They have the most to do with these emissions in this state and the health impact and it is possible to address the problems in this sector right now.

I'd like to look at three topics.

First, what are the fuel choices out there; and, where can they take us in addressing the vehicle emissions and greenhouse gas issues?

Second, what are -- let's look at a case study of probably the most significant polluting diesel sector in this state and most other states, that is, refuse and recycling trucks, which go up and down every residential street in every community and leave their pollution on every doorstep. They are more polluting and more numerous than transit buses. They are more of a health threat than school buses or produce delivery vans. They are a premier target for addressing their emission issues.

Third, I'll touch on, as I say, the policies.

And fourth, I will leave you with what happens if we don't do the things I'm suggesting.

Fuels.

One could have a discussion of bio fuels and the role they play. I've done a huge amount of research on that and have my transportation team, references are in it, in the discussions of ethanol and biodiesel in the paper that was distributed here.

There is much more behind it. I think that the idea of looking for something that is secure and domestic and renewable, that the previous speaker spoke about, is right on. I think cellulostic ethanol could be an enormous, enormous long-term contributor of up to, they say, 25 or 30 percent of light-duty vehicles, not all.

I have great concerns about corn-based ethanol and soy-based biodiesel because they are skewing the agricultural markets. They are -- ethanol is a net loser in energy and environment when you look at all of its impacts, so is soy from biodiesel.

Nonetheless, I would wait and hope and push for the commercialization of cellulostic ethanol and I would find that something that might be enormously promising and attractive in the future.

A huge investment in corn-based ethanol right now is tending to make all the farmers in the midwest go to ethanol. They're planting huge amounts of corn that is being used not in a hungry world for food, but for fuel. There are real questions there, but let me pass beyond those two and come to two fuel sources that I think can take us into a remarkably clean future.

First, I'll start with biomethane,

which is also a renewable, domestically produced fuel source. The methane that can be captured from landfills, from dairy operations, from agricultural operations, from sewerage plants is an enormous resource. And it must be captured looking forward because it is a huge greenhouse gas source if it is not captured.

I am sorry. I just need to get a glass of water.

I think it's been realized that these methane sources need to be captured and, in fact there is an estimate by the Department of Energy that you can produce about 10 billion, within the next decade, gallons of this fuel a year and it is reducing a methane problem and creating a clean fuel.

An interesting fact is that -- okay.

Oh, wow, three minutes.

I am going to pass beyond methane. It's a gas fuel. It can be combined with natural gas and the two used together in vehicles.

I am going to turn quickly to

natural gas. This is the fuel that is domestically plentiful, that is plentiful to our north and our south and can take us not only to the cleanest vehicles today, but on a path to hydrogen.

I spell out how it can do that in this paper and several of the reports we've written. It's the cleanest fuel today. I like to call it H80 because it's almost all hydrogen and it's taking us down a path to H100. It's available through pipeline system all over this state. It is able to be used in commercial engines in every light and heavy-duty engine that is made today, including refuse trucks.

It is a fully commercial option and affordable with federal incentives. And once you have a refueling infrastructure, about which I have some recommendations in this state, you cannot only refuel these vehicles, but you can begin to move toward what will be a hydrogen future. This is a path that is understood at the DOE, where I've been asked to present it in China, in India, in South Korea and lots of places more than it is here.

You can take advantage of natural gas combined with biomethane. You can then use the natural gas refueling stations to produce some of the natural gas hydrogen and use a combined high-thane fuel, which is four times cleaner than natural gas. And you can then, ultimately, when hydrogen fuel vehicles are ready, use those refueling stations to power hydrogen vehicles.

Moving on quickly because I have 30 seconds, to my last topic, the place where I would begin that transition with greatest enthusiasm in this state, and it has not begun here, is in looking at the thousands of refuse and recycling trucks in this state in every municipal area.

They're a vital resource. They're the most concentrated source of pollution that there is. Most of them are very old. Once they go on the road, they never have to change their pollution control practices again. They come in when they're permitted and they are used until they die.

They are very, very heavy

petroleum users, about 2.8 miles a gallon. We've written two books on the refuse truck sector. We are the only people who have ever written them.

I will tell you the power of public information. When the first report, Green and Garbage Trucks came out, we found 750 natural gas trucks in the country in '02. We went out and did workshops in about five states on the request of lots of planning agencies. We wrote another report at the beginning of '06, our second survey. We found the number of trucks had doubled from 750 to 1500. The number of communities using them had doubled from 26 to 57. They were performing well. They were not only massively reducing pollution, but they were massively reducing the noise in the communities they served, protecting the hearing and the health of the drivers and workers.

Twelve hundred of the trucks are on the west coast, but the first fleet is on the east coast, an hour and a half from here in Smithtown, New York. There is power with information. The head of Smithtown, got a copy of this report, heard a talk on it and said, We want to know what to do about our fleet. Within seven months, this isn't years of planning or anything, within seven months, they went out to bid. They got in bids from carters. They have 22 new natural gas trucks serving their community. And they are being looked at by every community on Long Island and as far a way as Quebec. I suggest it is an opportunity waiting to fall in your lap in New Jersey.

You can then look at transit buses and others, but I will leave a copy of this report, if you like.

The incentives are simply, in addition to federal incentives, what is needed in this state are a level of incentives that fully provide a level playing field for communities that want to buy and use these trucks. There are private-sector companies that will come in and build your refueling structure for you right now.

The incentives can be looked at. In addition to the federal, it just provides a level playing field. And this kind of transition can afford to be made. It will be made.

I would like to stop right here because I ran out of my one minute.

CHAIRMAN BLANDO: Yes.

MS. UNDERWOOD: Thank you very much. I am sorry to have gone so fast.

CHAIRMAN BLANDO: I just remind all speakers that the Clean Air Council does accept all written public comments, as well; That gets to be part of the record. If you have additional comments, you can submit those, as well.

Wilbur Mc Neil, Weequahic Park.

MR. MC NEIL: I will be brief and I will just submit my remarks and let that stand for itself. But just a little history on the Weequahic Park Association. We are 15 years old. We're a grassroots association. We meet every week and we're a short distance from Newark International Airport.

CHAIRMAN BLANDO: That concludes our public hearing. I apologize for letting things run a little bit late today. Thank you all for coming and thank you for your interest.

Our final report will be available in July, mid end of July on the DEP website, as well as through Sonia.

John, did you have a comment?

MR. MAXWELL: John, I just wanted to remind the public that all of our meetings are open to the public and we really enjoy and love to have public members come and you can find out about us, where we meet and all that stuff at our Clean Air Council website.

CHAIRMAN BLANDO: Yes. We meet monthly, except for the month of August, usually it's the second Wednesday of the month somewhere throughout the State of New Jersey.

MR. MC NEIL: I understand that the general public can't speak at those meetings.

CHAIRMAN BLANDO: Generally speaking, it is the council members.

MR. EGENTON: I would disagree with that, barring the annual public hearing once a year, which is this one, our meetings every month, except for the month of August are open to the public and we have engaged the public if there is a question being asked at the meeting, so I would stand corrected on that issue, sir.

CHAIRMAN BLANDO: Bill.

MR. MC NEIL: I'll speak to you afterward.

MR. O'SULLIVAN: I just want to thank the Council for another great hearing and I'll see you next month.

(Time noted: 4:25 p.m.)

C E R T I F I C A T E

STATE OF NEW JERSEY)
: ss.
COUNTY OF BURLINGTON)

I, ELLEN MARIE GUMPEL, a Certified Shorthand Reporter, Registered Professional Reporter, Certified Realtime Reporter and Notary Public within and for the States of New York and New Jersey, do hereby certify that the foregoing proceedings were taken before me on Wednesday, April 11, 2007;

That the within transcript is a true record of said proceedings;

That I am not connected by blood or marriage with any of the parties herein nor interested directly or indirectly in the matter in controversy, nor am I in the employ of the counsel.

IN WITNESS WHEREOF, I have hereunto set my hand this ____ day of _____________, 2007.

ELLEN MARIE GUMPEL, CSR, RPR, CRR