COMMONWEALTH OF PENNSYLVANIA
HOUSE OF REPRESENTATIVES

ENVIRONMENTAL RESOURCES AND ENERGY
COMMITTEE HEARING

STATE CAPITOL
EAST WING
ROOM 60
HARRISBURG, PENNSYLVANIA

THURSDAY, MAY 21, 2009
1:05 P.M.

PRESENTATION ON HOUSE BILL 80

BEFORE:
HONORABLE CAMILLE "BUD" GEORGE, MAJORITY CHAIRMAN
HONORABLE BRYAN BARBIN
HONORABLE EUGENE DePASQUALE
HONORABLE R. TED HARHAI
HONORABLE DAVID R. KESSLER
HONORABLE STEVEN J. SANTARSIERO
HONORABLE TIM SEIP
HONORABLE GREG VITALI
HONORABLE SCOTT E. HUTCHINSON, MINORITY CHAIRMAN
HONORABLE MATT GABLER
HONORABLE CHRIS ROSS
HONORABLE RANDY VULAKOVICH

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DEBRA B. MILLER
REPORTER

I N D E X

TESTIFIERS

SUBMITTED WRITTEN TESTIMONY

* * *

HANDOUTS

* * *

ANDREW PLACE
RESEARCH FELLOW,
DEPARTMENT OF ENGINEERING
AND PUBLIC POLICY,
CARNEGIE MELLON UNIVERSITY..(see attached handout)

JOHN CURTIS
FOUNDER AND CEO, GREEN ENERGY
CAPITAL PARTNERS, LLC.....(see attached handout)

MAUREEN MULLIGAN
THE SOLAR ALLIANCE.....(see attached handout)

P R O C E E D I N G S

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CHAIRMAN GEORGE: The Environmental Resources and Energy Committee hearing will proceed.

House Bill 80 amends Act 213 of 2004, known as the Alternative Energy Portfolio Standards Act, by amending definitions for alternate energy sources and Tier II alternate energy sources and adding other definitions, further providing for alternate energy portfolio standards.

This bill also establishes guidelines for the establishment of a carbon dioxide sequestration network. DCNR will collect the fees from entities involved with the carbon sequestration network in order to pay for the development and operational costs of the network.

A carbon sequestration fund is established in order to allow the DCNR to carry out these actions.

DCNR is also given the authority to establish permitting requirements and other regulations in compliance with this act.

I ask the Co-Chairman, the gentleman, Mr. Hutchinson, if he has any remarks.

REPRESENTATIVE HUTCHINSON: Thank you, Mr. Chairman.

I want to thank you for holding this hearing today.

Consumers across Pennsylvania, consumers and small businesses, are very concerned about the potential increases in energy prices as we go forward.

There are many things on the horizon. State Government continues to do things that increase people's energy prices, and many feel that this bill will also drastically increase electric prices in Pennsylvania.

So it is important that we take a good, hard look at this legislation, and I thank you for scheduling this hearing to do so.

Thank you.

CHAIRMAN GEORGE: I will also allow for a moment the gentleman, the chief sponsor, Representative Vitali, for a few short remarks.

REPRESENTATIVE VITALI: Thank you, Mr. Chairman.

The first thing I would like to do is to thank the Chairman for holding a public hearing on this important bill.

This bill, if fully enacted, will result in 12 million tons of carbon dioxide being taken from the atmosphere per year, which is the equivalent of 3 million cars per year taken off the road.

The second thing I would like to emphasis is this has been a team effort. There is an identical Senate Bill. We have worked with Senator Erickson on this; worked very closely with Representative Ross, who was instrumental in getting the AEPS bill passed 4 years ago; worked very closely with Representative DePasquale, who had the initial CCS legislation last term; along with people like John Quigley from DCNR, John Hanger from DEP and his staffer.

So this is in no way a one-person effort but it's more of a team effort.

The goal of the legislation -- the legislation has two pieces: increasing the Alternative Energy Portfolio Standards but also establishing a carbon capture and sequestration network.

They are closely linked because both pieces deal with clean energy. Both pieces deal with reducing CO2 into the air and dealing with climate change. Both pieces will result in more jobs for Pennsylvania and increasing our energy independence.

We have had input from interest groups. We've had input from GE. We've had input from Duke Energy. We've had input from environmental groups. All have given good input, and we look forward to their continuing input.

Finally, I just want to outline the nuts and bolts to give us a context for listening to the following testimony.

Specifically what House Bill 80 would do is increase the Tier I requirements of renewable energy -- wind, solar, and such -- from 8 to 20 percent between the years 2021 and 2026. It would not change the existing requirements up until 2020.

The second thing it would do would be to increase the solar photovoltaic requirements from .5 percent to 3 percent between the years 2021 and 2026. It would not change any existing legislation regarding the solar PV carveout.

The third thing it would do would be to require electric distribution companies like PECO and PPL to require 3 percent of the electricity they distribute to customers to come from coal-fired plants which sequester carbon starting in the year 2015.

And then the final thing it does would be to

require the Department of Conservation and Natural Resources to establish and operate or contract with a third party to do the same -- a carbon capture and sequestration network.

Thank you for appearing, and I thank the Chairman for his indulgence today.

Thank you.

CHAIRMAN GEORGE: I thank the gentleman.

We have a full agenda this afternoon, so consequently, it is imperative that those presenting their testimony keep their presentation within the allotted time. Your complete testimony then will be submitted for the record along with the others that are already submitted.

It was our intent to have Donald A. Brown, Associate Professor of Environmental Ethics, Science and Law, Pennsylvania State University, to testify today. Unfortunately, Dr. Brown was unable to be with us.

Testifying first is the Honorable John Hanger, Secretary of the Pennsylvania Department of Environmental Protection.

Good afternoon, Mr. Secretary, and welcome.

SECRETARY HANGER: Thank you, Mr. Chairman.

It's a pleasure to be here with you and

Chairman Hutchinson, members of the committee also.

This is an extraordinary committee. You've got great expertise within it, as Representative Vitali mentioned, and we look forward to working with every member of this committee.

I've been trying to get around to each member of the committee, and my staff at DEP is also trying to do that. We are in the thinking and listening phase.

We want to commend the sponsors of House Bill 80 for introducing this bill. And I will summarize my testimony, mindful of the Chairman's admonition that we've got to stay on track here. I will not read word for word.

Let me identify some of the key points in it.

The first reason why we are so committed to this bill and the process that will, I'm sure, lead to some changes to this bill is that the future of Pennsylvania is very well served by passing this bill.

In fact, we believe it is vital to the future of Pennsylvania. And when I say "we," that's the Department of Environmental Protection, but also

the Governor, who I was speaking with this morning about this very bill.

He is very interested in this bill, and he was very complimentary to all members on both sides of the aisle who are engaged in talking this out and working on this.

We believe it's so vital to our future because of the volatility in energy prices that we have experienced so clearly in 2008, and I will spend a little bit of time talking about that in a minute.

But it's also critically important because Pennsylvania is competing for jobs in alternative energy and energy conservation.

Unfortunately, since 2004, other States have actually passed us by. There are a number of States with whom we compete for this investment who have much more aggressive requirements than what was enacted in 2004.

Maryland, for example, now has a requirement of 20 percent by 2022. New Jersey has a renewable requirement of 22.5 percent by 2021. And Illinois, 25 percent by 2025, and I could go on in that vein.

When we are at 8 percent for our Tier I and 0.5 percent for our solar, we are now bypassed by most States. We are actually at the lower end of

the requirements for the renewable part of the portfolio.

We are also here because we are very strongly committed to helping Pennsylvania prepare for carbon regulation. That, in fact, has started.

The EPA has taken the position that the Supreme Court decision of a couple years ago requires the regulation of carbon and carbon sources under the Clean Air Act.

We all are very aware also of the fact that the Congress of the United States is debating cap-and-trade legislation.

We believe it's critical for Pennsylvania to be prepared and to be proactive. We believe it's vital for our economy as well as our environment.

This bill does in fact remove 16 million tons of carbon from the sources in Pennsylvania. It is the equivalent of taking 3 million cars off the road.

By the way, there are 10 million cars on the road, so this is a very significant reduction in our carbon emissions.

I would also want to now spend quite a bit of time talking about perhaps the core reason that we are in favor of this piece of legislation, and that

is the danger that volatility of energy prices and specifically fossil fuels pose to our economy.

In 2008, we got the lesson in a very hard way. Oil started at $70 a barrel in January of 2008, and I think we should remember that that was high by historical standards. That was a source of concern and indeed some economic disruption when it was at $70 a barrel.

By July of 2008, it was at $147 a barrel, and at that point, it was crippling. It was causing major economic damage, including affecting the value of the dollar.

We were shipping overseas when oil was at $147 a barrel, the equivalent of $700 billion, to meet our 60-percent oil imports.

This country is a rich country, even now after the major economic problems we have encountered. But we can't afford to ship overseas the equivalent of $700 billion just for oil.

Now, if it were just oil, one could say, well, it was unique to oil and it doesn't reflect on the energy picture generally or the other fossil fuels. But the same volatility was seen with natural gas. We went to $13 for a thousand cubic feet for natural gas in July of 2008.

I'm sure many of you had customers or constituents who were very concerned about heating oil. They were probably paying $4 a gallon, or looking at paying $4 a gallon, maybe even more. The heating oil bills could have been $4,000, $5,000, $6,000 just to get through one winter in Pennsylvania.

Coal also increased extraordinarily in 2008. When China moved from being an exporter of coal to an importer of coal, coal prices went extraordinarily high.

You cannot manage successfully that kind of volatility. And the volatility, of course, has gone now in the other direction, and we are seeing it bounce back up already.

By December of 2008, the prices collapsed. We went from $147 in the oil market to the equivalent of about $33 at the low point in December. It's just an incredible cratering of the price.

Natural gas went from $13 a thousand cubic feet in July of 2008 to in April of 2009 about $3.30.

Now, we're going to use fossil fuels for a very long time, but the only thing that is certain about the fossil fuels in terms of the economic

impact is that they are extraordinarily volatile, and that when they do these sharp, sharp gyrations, that they cause substantial economic disruption.

So our major reason for supporting this bill is to diversify, to diversify how we make electricity, to include sources other than fossil fuels in how we make electricity.

Now, this bill in many cases is actually modest when compared to what other States are proposing, but we believe it's important, critically important for the security of Pennsylvania's economy to take this step.

In addition to that concern, I think it's fair enough to ask, how is the AEPS working, the one that was in fact passed in 2004?

I have already expressed that it's our belief that other States have passed us by, and that is causing a competitive disadvantage to Pennsylvania.

But so far, I have good news to report on the compliance with AEPS. Our utilities and others, who are subject to the requirement of the AEPS, 5 years into it are complying with the AEPS. We are on track to comply with the AEPS.

When we look at the renewable energy

projects that are under construction right now, and then more to the point, others that are in development in Pennsylvania, just in Pennsylvania we have more than enough renewable energy resources to meet the existing AEPS.

If you look at the renewable energy resources that are in development in the PJM Power Pool -- and Pennsylvania is a part of the PJM Power Pool. We export through the PJM Power Pool, and we import through the PJM Power Pool -- there is an even bigger surplus of renewable energy projects that can meet our AEPS requirement.

So 5 years into the existing AEPS, we are on schedule, and we have every reason to believe that we'll remain on schedule and easily meet this requirement by 2020.

In terms of the ratepayer issues, our first concern, of course, is if we remain so tethered to the very volatile fossil fuels, we are going to have extraordinarily high electric prices -- guaranteed -- at some point.

When natural gas goes to $13 for a thousand cubic feet, electric prices are going to follow. Take that to the bank. Natural gas increasingly is setting the price for electricity in the wholesale

market, and it will flow through to retail customers.

So if your concern is first and foremost providing ratepayer protection, we must, we must diversify how we make electricity. That is critically, critically important.

In addition, this bill has important ratepayer protection elements that I do want to emphasis.

The first one, of course, is that the credit price is capped. There is a cap in this bill for the credit price, as there was in the existing AEPS.

There is a price above which the credits are not allowed to be passed along to the ratepayer. We strongly support such caps in this legislation.

The other very important protection, of course, is the force majeure clause. If in fact there is a problem so that the power from these sources is not available, then the PUC, after conducting an appropriate hearing with appropriate evidence, has the power to declare a force majeure to deal with that circumstance.

Those two protections for ratepayers are in the bill and also critically important.

Lastly, I do want to spend a little bit of time talking about carbon capture and sequestration.

Carbon capture and sequestration is a critical technology for Pennsylvania. We believe this technology is also vital to our economy and vital to our environment. We will get right now roughly 50 percent of our electricity through coal-fired generation.

And we also know, as I have pointed out, that the carbon emissions are today regulated by the EPA through the Clean Air Act, and we also have every reason to believe that they are going to be regulated through a new act passed by Congress.

Carbon capture and storage technology, whether one likes it or not, is needed. It is needed. It is needed environmentally and economically.

I want to particularly focus on the fact that it is needed because those who insist that we can supply all of our electric sources or needs from something other than coal or eliminate coal and rely on renewables and energy efficiency are in fact factually incorrect.

It's just not possible, at least not in the next 20 years or 30 years. Maybe at some point in

the future, it will be possible. But for the foreseeable future and for the period of this act at least, between now and 2026, it is just not going to happen.

So we absolutely need to have this technology in place so that we can ensure that coal can be a part of our generation mix and, at the same time, do so without increasing concentrations of carbon dioxide in our atmosphere.

Now, others have said that carbon capture and storage is not ready for use. I would answer those critics by saying in fact it is ready for use today.

And I think it's important to understand that there is a wide number of stakeholders who agree with that statement. It's not simply the Department of Environmental Protection or DCNR. There are certainly folks in industry who agree with that statement, but there are also experts at the national environmental groups.

I quote George Peridas of the Natural Resources Defense Council, who stated as recently as April 3, 2009, a little more than a month ago, quote, unquote, "The truth is that CCS technology is ready to begin deployment at large, commercial scale

today."

That is the leading spokesman on this issue for one of the nation's most respected national environmental groups. He says it's ready to be deployed at large scale today. He says that's the truth, and I agree with him. That is the truth.

In my testimony, I give examples where carbon capture and storage technology is being used today in the world.

You should also know that in Pennsylvania, we have a significant amount of experience with storing gases. We have 60 storage sites in Pennsylvania where we are storing right now natural gas.

Around the country each year, we inject over 30 million tons of carbon dioxide underground for the purpose of enhancing oil recovery. This is not something that we don't know how to do. It is not something that we don't have the technology to do.

Lastly, I want to really emphasize the experience that we have here in Pennsylvania, in many ways the unique experience to lead this country on carbon capture and storage.

DCNR -- and Secretary Quigley is going to talk more about this -- has 26 geologists. They are

acknowledged as experts in the subsurface of Pennsylvania and who have been working with the Department of Energy's Midwest Regional Carbon Sequestration Partnership for a long time.

In addition, DCNR has formed a Science Advisory Committee with some of the country's and indeed the world's leading experts on carbon capture and storage technology to advise us on this technology and the storage of carbon.

Lastly, State Government and many private-sector leaders are partnering with the Clinton Foundation. The Clinton Foundation has come to Pennsylvania to do carbon capture and storage work.

They are doing this work in Australia as well as the Netherlands and in Pennsylvania. They have provided extraordinary expertise to all of us in order to help us to develop a network of plants, many of them existing plants and perhaps a new-build plant, an advanced coal plant, that could be networked together and move large amounts of carbon dioxide that will otherwise go into the atmosphere and pump it underground in a safe storage site here in Pennsylvania.

It is for all these reasons that

Governor Rendell and myself feel so strongly about this bill. We know that there will be amendments, and we stand ready to work with you on crafting those amendments.

But as I say that, I do want to end by complimenting again the authors of the bill and the sponsors of the bill for starting this critical conversation.

Thank you very much, Mr. Chairman.

CHAIRMAN GEORGE: I thank the gentleman for his testimony.

I'm about ready to recognize fellow members for one question, that I ask for them to direct very properly, very directly, and for them to be answered as well.

But being the Chairman, I have some flexibility, if you'll allow me. That's why I would like to introduce the young lady that just walked in. That's Edna, my wife of 57 years.

Edna, do you want to stand up?

So, you know, if she can put up with me for 57 years, you guys can put up with me for a few more.

I turn to the first questioner. Who will that be? No questions for the Secretary?

Oh; the gentleman, Mr. Hutchinson, is recognized for a question.

REPRESENTATIVE HUTCHINSON: Thank you.

I guess I wanted to focus, you know, on the one statement you made about how we as a State must move in the direction of more solar, more wind, if we want to keep electric rates down.

You know, most of what I have seen is that these are the highest-costing types of electric generation out there. You specifically mentioned the natural-gas aspect and if that price goes up, then our electric generation rates will follow close behind.

But I guess the thing that puzzles me is why we as a State are not promoting those -- why are we not promoting better than we are the production of natural gas and other fossil fuels that, A, are cheaper; B, they work; and C, we have lots of it.

It just seems like we are tilting at this thing out here that may or may not work when we have proven reserves in-State and we are not doing our utmost to promote those.

Can you---

SECRETARY HANGER: Are you finished?

REPRESENTATIVE HUTCHINSON: Yes.

SECRETARY HANGER: I would love to reply to that.

It's a fair question and a fair point of view. I have, not too surprisingly, some very strong disagreement with it.

First, in 2008, we issued a record number of natural gas permits -- 8,000 -- four times the number of natural gas permit drilling permits than were issued in 1999.

I don't know what more we could do to create a bigger record, but we---

REPRESENTATIVE HUTCHINSON: If you didn't tax it, it would be one. But that's, you know---

SECRETARY HANGER: Excuse me?

REPRESENTATIVE HUTCHINSON: If we didn't propose a tax on it, that's one good thing.

SECRETARY HANGER: Well, this could get to be a long hearing here.

But I think the first point is that we had a record year in 2008 for gas drilling. And the Governor and I are determined to produce the gas, and also protect the water. Both are equally important, and both are being done.

Natural gas is a very important fuel. It's one that does have some environmental benefits as

well, so you can't produce it with zero environmental impact.

We are committed to developing our existing resources. And it is, Chairman Hutchinson, not an either/or question. We need to be doing all of this, and that is what I'm here today to say.

I can absolutely look you right in the eye, as I'm doing right now, and say we are doing everything possible to produce the natural gas that we have. And this Administration agrees with you that the natural gas reserve is an incredibly important opportunity for Pennsylvania.

Obviously, when natural gas fell to $3.30, the amount of drilling around the country has declined. But I'm absolutely sure that at some point -- I can't tell you when -- the natural gas price will rise well above where it fell in April.

Indeed it is now about 4 bucks, and oil has already gone up to about 60 bucks after being at 33 bucks. It has doubled, you know, in 4 or 5 months. The volatility is just astounding.

Now, your point about electricity costs.

Representative, when natural gas exceeds about $6, $7, or $8 for a thousand cubic feet, it in fact becomes more expensive than making electricity

from some of these renewable energy resources.

It is more expensive to make electricity when natural gas is at 6 bucks, 7 bucks, or 8 bucks than generating a modern, efficient wind turbine, for example.

When natural gas is at $13, and we have seen that as recently as July 2008 -- and after Katrina, it was at $16, Representative, in 2005 -- then natural gas is extraordinarily expensive. It is much more expensive than just about all of the other alternatives. And the fact that natural gas is often on the margin in the electric marketplace does mean that electric prices will go up.

Now, I'm not saying get rid of natural gas. I just told you, I agree, we ought to produce natural gas as much as possible.

But I'm also telling you, as sure as I'm convinced that that position is right, that to fail to diversify in the ways that this bill does, by moving to technologies that are not dependent on the price of natural gas, not dependent on the price of coal or oil or the fossil fuels, would be a horrific mistake for the ratepayers that I know you are genuinely concerned about. It would just be a terrible, terrible mistake.

I personally believe that by 2026, these fossil fuels will be even more expensive than what we've seen over the last few years. I could be wrong; I'll admit that to you. But I am not wrong that we are going to see great volatility between now and then, extraordinary volatility that causes substantial economic disruption.

And this piece of legislation helps to diversify and manage to some extent that risk.

CHAIRMAN GEORGE: Has the gentleman concluded?

REPRESENTATIVE HUTCHINSON: Yes.

CHAIRMAN GEORGE: The gentleman, Mr. Barbin.

REPRESENTATIVE BARBIN: Thank you, Mr. Chairman.

And thank you, Secretary Hanger.

(Microphone malfunctioning.) I think I can go without the microphone.

SECRETARY HANGER: Okay.

REPRESENTATIVE BARBIN: Your testimony, I think, was that we had 50 percent---

CHAIRMAN GEORGE: If the gentleman will please turn the mike on. You are being recorded.

Shove it away from you.

REPRESENTATIVE BARBIN: Thank you.

CHAIRMAN GEORGE: If you have to, step out in the hall.

REPRESENTATIVE BARBIN: Thank you, Mr. Chairman. It does work better this way.

Mr. Secretary, is there an investment that is being considered at the Federal level for those States that move forward with this type of bill that have a carbon sequestration network plan? Is that true?

SECRETARY HANGER: There is money available to support carbon capture and storage projects.

I have been in Washington twice, once with the Governor, meeting with Secretary Chu and other members of the Department of Energy, trying to make the case to them that Pennsylvania has this, what I'll call the Pennsylvania Network that the Clinton Foundation is working with us on, and that network would be a tremendous place to invest those Federal dollars that are being set aside specifically to develop the carbon capture and storage technology.

REPRESENTATIVE BARBIN: Is there any question in your mind that the passage of this bill will help Pennsylvania make a successful approach to the Federal Government for those funds?

If we move forward this bill, will we be in a better position to access that money?

SECRETARY HANGER: Much, much, much better.

It's a competitive process. Rightly, DOE wants to see what private sector companies are doing -- how much will they invest? -- and they also are very interested in what States are doing.

As Secretary Quigley, I'm sure, will tell you, we are doing a lot in Pennsylvania to move it forward.

But the DOE is aware of this bill. They know that this committee has this bill, and they understand what it will mean if this bill doesn't move about Pennsylvania's commitment to this technology and to renewables generally, and they will also take a different message, a much better message if this committee moves this bill. It will help us in Washington with the case that we're making broadly on energy areas and specifically on carbon capture technology.

REPRESENTATIVE BARBIN: And there has also been a statement made today that we want to use our natural gas.

Will there be spin-off benefits if we adopt this carbon sequestration network, which applies for

the most part to coal-based industries. Will there be spin-off benefits in Pennsylvania trying to reach the answers to where we're going to put our natural gas brine water or the heavy metals that are associated with natural gas coming out of the wells, because there is some discussion right now about injection wells as a location for the brine water.

SECRETARY HANGER: Yeah; around the country, injection of brine water underground is a use. We in fact have some small wells in Pennsylvania where water is injected.

Those two issues are perhaps related in the sense that the more we learn about the geology of Pennsylvania, the more possible locations that are appropriate and might be identified. And just as importantly, where it's not appropriate, you know, where you shouldn't be doing something like that. In that sense, there may be some spin-off benefit from it.

What I would like to emphasis is the carbon capture and storage technology and the network that we're talking about would service certainly coal-fired power plants but also steel mills, cement plants, ethanol plants. It could potentially, I suppose, service a natural gas plant that is burning

carbon dioxide.

There are a number of different things, uses, in our economy that need an ability to capture and store carbon.

Now, this bill is focusing on electricity production, and in that sense, it's restricted to the uses in the bill. But as we develop this technology and as we create the storage, it is our hope and it is the Clinton Foundation's hope that we can capture and store carbon from many existing sources.

REPRESENTATIVE BARBIN: Okay.

And my last question is, do you have any doubt, based on your written testimony here concerning Norway and the African carbon sequestration networks, that if we do this, that if we do carbon sequestration, that if we do it in the right way, it will be a safe method for us to deal with the carbon emissions? Do you have any doubt about that?

SECRETARY HANGER: No, I have no doubt about that. And more to the point---

CHAIRMAN GEORGE: Did you say one question two questions ago?

REPRESENTATIVE BARBIN: I was going to say thank you, Chairman, for your tolerance. I

appreciate the opportunity to question the Secretary.

SECRETARY HANGER: I would just quickly add, I think it is telling that the Natural Resources Defense Council says the truth is that CCS technology is ready to begin deployment at large, commercial scale today.

They are talking about the technology generally, and they are saying it is ready today. And that organization is careful. It puts the environment first. It's an environmental organization.

And it's not alone in saying things like that about the technology generally. They are not commenting about the specifics of this bill, but they are commenting about this technology.

REPRESENTATIVE BARBIN: Thank you, Mr. Chairman.

CHAIRMAN GEORGE: It must be contagious. The gentleman, Mr. Kessler.

REPRESENTATIVE KESSLER: Thank you, Mr. Chairman.

You mentioned 16 tons of carbon per year. Can you tell me how you arrived at that number?

SECRETARY HANGER: The 16 million tons; yes.

We scoured the bill for the amount of renewables and the amount of carbon capture and storage. I think in the Tier I, if I'm remembering these numbers correctly, the increase in Tier I would reduce carbon dioxide by roughly 12 million tons, and then the carbon capture and storage piece could reduce the emissions by close to 4 million tons.

I would be glad to provide you the calculations specifically.

REPRESENTATIVE KESSLER: Okay. So the coal-fired plants, you're talking about 4 million?

SECRETARY HANGER: I believe. I'm working from my memory, and I believe that's right.

REPRESENTATIVE KESSLER: All right.

And then you also mentioned that there's a break-even point as far as wind turbine versus gas. What was that price again?

SECRETARY HANGER: Somewhere between $6 and $8.

REPRESENTATIVE KESSLER: Okay.

SECRETARY HANGER: It depends on the price of steel and the components that go into the wind turbine and to some extent the world wind market. But somewhere between $6 and $8.

REPRESENTATIVE KESSLER: Thank you.

CHAIRMAN GEORGE: The gentleman, Mr. Gabler.

REPRESENTATIVE GABLER: Thank you very much, Mr. Chairman.

Mr. Secretary, thank you very much for your testimony.

My question just involves any projections that you might have done forward as far as what you would expect or what the department would expect the price difference to be should this bill be implemented.

Have you done any research into what consumers might expect as the energy cost using these alternative energy sources going forward?

SECRETARY HANGER: We are beginning to do some of that research and to look at those questions.

I mean, the real issue there, to answer that question definitively, of course, is the assumptions you make about natural gas.

I mean, if in fact natural gas stays at $3, $4, the technologies here, at least at today's prices, would raise prices somewhat.

If natural gas went to $13 or $16 for a thousand cubic feet, then these technologies actually would have a dampening effect on price.

So to be honest with you, depending on what assumption you plug into a study like that, you can pretty much get any answer you want. And that is why I have not come forward and said I know what the price of fossil fuels is going to be. The only thing I have come forward and said with certainty about those prices is that we know they are very, very volatile.

They have been extraordinarily volatile just since December 2008 and today. Oil has basically doubled just in 4 months again. It's incredible. And if you want to stay tethered to that energy presence, I fear for our future. We cannot stay tethered to that.

REPRESENTATIVE GABLER: Thank you.

I would say that aside from the projections -- and you're right; there could be much volatility on the fossil fuel market -- aside from those projections, if we could make projections or if the department could make projections on what the expected cost of alternative energies would be.

SECRETARY HANGER: Sure.

REPRESENTATIVE GABLER: I think that would be a useful piece of information for the committee to consider.

SECRETARY HANGER: Sure. We can grab that for you.

REPRESENTATIVE GABLER: If that could be presented in writing, if and when that's available, I would really appreciate that.

SECRETARY HANGER: We would be glad to do that.

One thing I would point out about the way the bill is written, it has a cap on the credit price. So there is a ceiling beyond which the price is not allowed to be recovered from ratepayers.

REPRESENTATIVE GABLER: Thank you very much.

If the Chairman would indulge me for one more short question?

CHAIRMAN GEORGE: Yes.

REPRESENTATIVE GABLER: Thank you, Mr. Chairman.

The other question I have, and this is just something that hopefully -- a concern that I've heard, and maybe you could shed some light onto it.

With some of the alternative energies that are out there that do not necessarily have a constant source, one example being wind, if the wind dies down, I know there needs to be some sort of a backup generation source. Is that correct?

Without some sort of long-term, large-volume battery that that could be stored over time, how would it result that a wind, for example, a wind generator would reduce our reliance on fossil fuels, because we would still need to keep a backup generator going, and you can't turn them on and off with the flick of a switch.

SECRETARY HANGER: Sure.

In fact, we have -- well before we ever had one megawatt of wind on the system, we've always had something called spinning reserves in our electric system.

We keep a backup unit, or units, ready to go within 10 minutes to deal with the fact that all machines break down, and they break down just like that.

In 1994, I had the duty of calling the Governor at the time and saying that we were facing rolling blackouts at a time when the temperature outside was about minus-20 degrees. And the straw that broke the camel's back at that day and that moment was the Susquehanna Nuclear Power Station clicking off. And we, unfortunately at that point, used up all our backup.

So it is standard practice within the

electric system and at PJM -- and I know Representative Ross and others have visited PJM -- to have a system of backup for all plants.

And the amount of backup is actually typically sized to at least the biggest unit that is running. So if the biggest unit that is running is, say, a coal plant at 1,200 megawatts, you have at least 1,200 megawatts ready to take its place at essentially a moment's notice.

So studies have been done looking at what additional costs, more intermittent supply would add to that system. And until you get to large penetrations or a large amount of wind or solar or the intermittent sources, you actually incur virtually no additional cost.

When you get to perhaps 10, 15 percent of the supply coming from wind, there is a small additional cost to back up that system.

But when the studies had been done -- and GE is one of the companies that has done this study. And they have a witness here. I don't think he's from the wind division, but they have actually done these studies in New York -- the finding is the economic benefit of the additional power more than compensates for any small, slight increase in further

backup power that would be needed once you reach these large amounts of new wind.

In Pennsylvania right now, we are nowhere near those kinds of numbers, nor are we within the whole PJM system.

REPRESENTATIVE GABLER: Thank you very much.

And thank you, Mr. Chairman.

CHAIRMAN GEORGE: I thank the gentleman.

And I thank the Secretary for his indulgence.

SECRETARY HANGER: Sure.

CHAIRMAN GEORGE: We are going to call on the next individual, which is the gentleman, John Quigley, the Acting Secretary of the Department of Conservation and Natural Resources.

And again I am going to insist that we be a little bit more direct so that we are able to get all the witnesses and all the questions handled properly.

Good afternoon to you, Mr. Quigley. You may proceed.

ACTING SECRETARY QUIGLEY: Thank you.

Good afternoon, Mr. Chairman, Chairman Hutchinson, and members of the committee. Thank you for the opportunity to be here this afternoon.

I appreciate the leadership that this committee has shown. I appreciate Representative Vitali's leadership in proposing House Bill 80. I would like to commend him for that. I think this legislation is needed.

I will truncate my testimony, my written testimony, but I want to focus in some detail on some of the work that DCNR is doing relative to carbon capture and storage.

This bill, in my view, is essential for a number of reasons. To increase the amount of renewable electricity that is generated in Pennsylvania will diversify our energy supplies. It will create green jobs. And very significantly, it will reduce the State's carbon dioxide emissions and be a very important tool in the battle against global warming and climate change.

And make no mistake about it, climate change is the most significant environmental challenge facing the world today and certainly facing Pennsylvania. It threatens our environment, our economy, our public health, and I think indeed our way of life.

It presents challenges that we cannot escape. And we also cannot escape the responsibility

of starting to deal with these challenges now, and that is what House Bill 80 attempts to do.

Keep in mind that Pennsylvania, I mean, it's 1 percent of the planet's global-warming gases, more emissions than any State in the United States except two -- California and Texas.

We are the nation's fourth largest coal producer, and more than 50 percent of Pennsylvania's electricity is coal-fired. So if we are going to take the challenge of climate change seriously, we have to think about how we sustainably grow our economy and tackle the challenge of climate change at the same time.

So in addition to investing in renewable energy and conservation, this Commonwealth has to find a way to burn coal as cleanly as possible, because we will be relying on coal for many years to come. I don't think there's any question about that, as Secretary Hanger said. So House Bill 80 is an attempt to deal with that very issue head on.

What carbon capture and storage is -- and here's where I will get a little bit tedious -- is the capture, transportation via pipeline, and the storing permanently underground of carbon emissions. We believe it offers great promise to the

Commonwealth to confront our global warming challenge and grow the State's economy.

There are available technologies -- as Secretary Hanger quoted the Natural Resources Defense Council -- there are commercially available technologies that are ready to be deployed today.

Pipeline technology is mature and has been in place for literally decades. The injection and underground storage of carbon dioxide is analogous to very well understood practices like natural gas storage, which has been occurring in Pennsylvania for decades.

Indeed, carbon dioxide has been captured, piped, and stored underground in the United States and Canada for decades to recover oil from depleted oil fields.

Every year, 45 million tons of carbon dioxide, which is the equivalent output of 10 to 15 500-megawatt coal-fired power plants, is transported over 3,500 miles of pipeline in the United States and Canada. This technology and this approach and this application, they are all very well understood.

Secretary Hanger mentioned projects in the North Sea and in Algeria that each store over a

million tons of carbon dioxide per year, again, that are well understood and have been in place for decades.

Carbon capture and storage is indeed ready to be deployed today. Technology is not the barrier to the deployment of carbon capture and storage. The problem is economics. There is a significant need for public policy supports to assist in the early-stage deployment of these projects.

The carbon storage network that House Bill 80 contemplates would enable the Commonwealth to capture very significant economies of scale by connecting multiple plants to this network. It would help to mitigate the high cost levels of this technology that would be in place initially.

And combined with savings in developing this kind of shared infrastructure, the Commonwealth has an opportunity to create a very significant asset that will be important to the Commonwealth with the imposition of Federal carbon constraints.

A very important aspect of economic feasibility is the treatment of long-term liability in the financial planning process.

House Bill 80 allows the Commonwealth to accept liability for a limited amount of stored

carbon to incentivize the first movers of this network. And I think this is critical to enable the early movers to finance their projects. But as I'll say in a moment, there may even be some options to deal with that issue as well.

There have been a number of studies done around the country about the potential to store carbon. There are some studies that DCNR has been a part of for the last 7 years through the Midwest Regional Carbon Sequestration Partnership, which has estimated that Pennsylvania has essentially a natural competitive advantage when you look at carbon capture and storage.

We have the potential to store several hundred years' worth of the State's emissions literally beneath our feet, and that is a competitive advantage compared to other States. And if we use that resource, we have an opportunity to not only deal with the global warming challenge but to grow our economy at the same time.

We have launched a very intensive effort to identify the State storage potential and to facilitate the development of this network.

If we are successful in Pennsylvania in developing these technologies, that means that our

abundant coal resources can be used in a more environmentally friendly manner, and we could also have an opportunity to create an extraordinarily high number of research and development, manufacturing, retrofit, and export jobs.

The States that lead in the development and deployment of carbon capture and storage technology will win the economic development race as well, and we can become the home for the manufacturing jobs, the kinds of jobs that cannot be offshored or outsourced and create a huge economic engine for the Commonwealth at the same time.

DCNR, pursuant to Act 129, which was passed last year, has just concluded an initial assessment of the State's geology, and our findings are very simply that the State's geology can support the development of a network of carbon dioxide storage around the Commonwealth. This network need not be publicly owned.

Indeed, we have also found that there is potential to use some of the captured carbon emissions to recover oil and natural gas in depleted formations and perhaps find some other beneficial uses for that CO2 in industrial processes. And perhaps, based on some early research that Penn State

is doing, to use some of the captured CO2 as a fracing agent and get away from the use of water in Marcellus exploration. That is a potential that we need to explore, but it is a tantalizing one for the Commonwealth.

If these opportunities to beneficially reuse carbon dioxide that is captured in this network come into place, there is an opportunity to reduce or even eliminate the need for public liability under this network.

So there are some business issues that have to be worked through. And as Secretary Hanger mentioned, we are working with the Clinton Foundation on the development of a business plan for this network to try to fully examine some of these opportunities.

When you look at geology, we have identified four potential storage reservoirs in western and north-central Pennsylvania that meet the U.S. Department of Energy's criteria for consideration as permanent receptacles for storage of carbon dioxide, and they are listed and a map is included in my testimony.

Now, our preliminary identification of these reservoirs is just the beginning of the process, and

I think it is important to understand that. But while it is the beginning of the process, it is not to say that the legislative framework for a carbon capture and storage network can wait.

Siting and crafting the public policy supports that are going to be necessary for this network have to proceed together and, in my view, have to proceed now. It is important that we move this work forward.

The next step in DCNR's work will be to gather seismic data beginning in July across targeted areas of the Commonwealth to further our understanding of the State's geology and further proceed down the path of identifying specific candidate storage sites.

To make a final determination on any particular storage location will require several years of very advanced scientific evaluation.

In addition to the business expertise that we are bringing to this task by virtue of our partnership with the Clinton Foundation, we have also created at DCNR a Science Advisory Committee, which is composed of more than a dozen nationally recognized experts in various aspects of geologic storage of carbon dioxide.

This committee will act as a scientific peer review of our work, and it will include representatives of Penn State; the Kentucky, Illinois, and Texas Geological Surveys; the University of Regina in Canada; the University of Pittsburgh; the U.S. Department of Energy's National Energy Technology Laboratory; West Virginia University; Carnegie Mellon University; and the Lawrence Livermore National Laboratory.

This committee is going to bring very diverse expertise to bear and to focus on DCNR's geologic technical assessments.

Now, any potential storage site that is identified in this process will be very extensively monitored beginning in the pre-development, pre-injection phase, right through injection and post-closure of a facility. The reservoir will have to be continually monitored so that safety and performance can be assured.

It's important for you to understand that the science of geologic storage of carbon dioxide is well understood, and in fact so much so that commercial insurance is now available in the marketplace for geologic storage sites. And we have been in contact at DCNR with some of the major

insurance providers globally who are writing policies and putting private capital at risk for geologic storage projects.

And we will have more to say and report to the General Assembly in the next report that DCNR is preparing pursuant to Act 129 that is due to be submitted to you, Mr. Chairman, and your counterparts in November of this year.

Now, House Bill 80 creates the framework for the first early mover carbon capture and storage network in the United States. It recognizes that geologic formations that lie beneath Pennsylvania's surface offer one of the most promising means available to safely and permanently control our carbon dioxide pollution.

We think that Pennsylvania's geology can provide literally the foundation for a sustainable economy for Pennsylvania's future in a carbon-constrained world.

We are privileged to be a part of this. We are responding to the challenge that Governor Rendell placed before us to do this geologic work.

I very much look forward to working with all of you and answering questions that you may have as these studies go forward, and I would be more than

happy to make myself available to any and all of you at any time.

Thank you.

CHAIRMAN GEORGE: Has the gentleman concluded?

ACTING SECRETARY QUIGLEY: Yes, sir.

CHAIRMAN GEORGE: I recognize the gentleman, Mr. Vitali, for a question.

REPRESENTATIVE VITALI: Thank you, Mr. Chairman.

And thank you, Acting Secretary Quigley, for the great work you've done on this.

I would like to just focus in on the issue of REC credits, renewable energy credits. And as you know, in the drafting of this bill we set it out so that if an advanced coal plant spends the money, puts the equipment on, puts itself in a position where it in fact can capture carbon but there is no storage network prepared to receive it, it still gets the REC credits.

Now, that has been criticized by some environmental groups saying that it's not fair; it incentivizes coal plants being built. And it has also been suggested that the better approach would be to create a carbon capture and sequestration network

first that in fact works and then award REC credits.

Could you comment on this and as to why you have chosen to take the approach that is in fact in the bill?

ACTING SECRETARY QUIGLEY: Well, I think, first, the question is fair and is reasonable.

My view of this is simply this: that, again, look first at the global warming challenge. The science says that we have got to reduce our emissions by at least 80 percent by 2050 if we are going to stave off the worst impacts of climate change -- so running the clock backwards.

That means that carbon capture and storage technology has to be deployed and essentially be "business as usual" by 2025 at the latest. If we are going to hit that target, that means that the first commercial scale deployments, the first networks, have to be in place by 2015, which means we should have started about 5 years ago.

So we are on a very accelerated pace. It is our goal to either, as DCNR or through a private party, have a first sequestration site available to accept carbon by 2015.

It is completely appropriate to connect the

development of the network with the legislative underpinnings. Very simply, power plants are going to have to invest millions of dollars in the capture technology, and from a business-planning standpoint, it is unrealistic to expect them to make that investment and then not receive the benefit of that investment if, through no fault of their own, a facility isn't ready.

Now, I will say with a high degree of confidence that I think we can meet the 2015 deadline. In fact, we might even be able to get there, get under the finish line, before that.

But I think the timelines contained in the bill, while aggressive, are achievable. I believe the provisions of the bill with respect to the green energy credits are appropriate and are needed to give the business side of this equation the appropriate investment horizon and timeline with which to make these millions of dollars' worth of investments.

REPRESENTATIVE VITALI: Thank you, Mr. Chairman.

CHAIRMAN GEORGE: I thank the gentleman.

I just have one little question.

What do you believe the risks are of the underground storage of CO2, and what will the

department do to minimize or eliminate these risks?

ACTING SECRETARY QUIGLEY: That's an excellent question, Representative.

There are many risks to underground storage of CO2 that are well established in the scientific literature and in the engineering work around this subject.

If you over-pressurize a CO2 storage facility, just like if you over-pressurize a natural gas storage reservoir, you can create movement of the earth -- manmade mini-earthquakes.

You want to make sure that CO2 does not come in contact with groundwater. You want to make sure there are no leakage pathways. You don't want to see any leaks of CO2, just like the owner of a natural gas storage facility doesn't want to see any leaks in their facility.

There are literally a dozen or so different risks that have to be assessed in the process of developing a site, and one of the next steps that DCNR is going to take in conjunction with gathering this geologic data is to conduct a risk assessment, to retain professional engineering expertise -- highly specialized engineering expertise -- to

conduct the risk assessment.

In our conversations with the insurance companies that are writing policies for geologic storage, they say very simply that the best insurance policy is a good site. So the investment of literally 2 or 3 years' worth of intensive study at a specific location is what provides the best hedge against risk.

You've got to study your potential location very intensively with every scientific means at your disposal to make sure that you understand the characteristics beneath the ground, you model and understand the potential movement of the stored carbon dioxide, and plan a series of mitigation measures so that you can know where the carbon is moving and take remediative action if it is in fact necessary.

So there's a well-established procedure. In fact, there are cutting-edge standards from the U.S. Geological Survey, the World Resources Institute, and other international panels that have laid out risk criteria and risk-minimization techniques, and we are following those.

Some of them are not even published yet, but we are following all of that state-of-the-art work as

we proceed with our work.

CHAIRMAN GEORGE: I thank the gentleman.

Do you have a question, Mr. Hutchinson?

REPRESENTATIVE HUTCHINSON: Thank you.

Obviously -- well, maybe it's not obvious, but we may or may not have very vastly different world views about what global warming is all about and is it real and all that.

But I'm going to go somewhere else on my question, and that is, specifically within this bill I understand that it does give DCNR authority in an area -- it's hard for me to get my brain around it, because it's pretty new.

You know, a couple years ago there was a firestorm across America about eminent domain power, and my understanding is that this bill does give DCNR condemnation authority over geologic formations. And that's, as I said, that's really hard for me to get my hands around that, and I just want you to explain how and under what circumstances DCNR would condemn underground geologic formations. If you could talk about that a little.

ACTING SECRETARY QUIGLEY: Well, Mr. Chairman, I would respectfully disagree with you with that interpretation.

There is nothing in House Bill 80 that grants DCNR the power of eminent domain. What it does do, the plain language of the bill allows us to acquire or lease geologic formations. It does not specifically give DCNR the power of eminent domain.

I don't interpret it that way. I don't think anyone that has looked at the bill interprets it that way. We would not be asking for that power.

Clearly, looking out into the future, there will need to be dozens of these types of storage facilities located around the Commonwealth, and the challenge of assembling core space will be a significant one.

There have been legislative proposals in Washington to deal with those issues. But this bill does not -- I repeat, does not -- contemplate the granting of eminent domain powers to DCNR for this purpose.

And I would be happy to have a more off-line conversation with you if that would be helpful.

REPRESENTATIVE HUTCHINSON: I would love to do that.

Thank you.

CHAIRMAN GEORGE: I thank the gentleman for his testimony.

The next individual will be the gentleman, Norman Shilling, Product Line Leader of Power Generation, GE Gasification.

Welcome, sir.

DR. SHILLING: Thank you, Mr. Chairman.

CHAIRMAN GEORGE: Now, again I'm going to caution all that it's getting to be that ever we won't be fair with the rest of the witnesses, so let's answer the inquiries very directly rather than a complete dissertation.

You may proceed, sir.

DR. SHILLING: Thank you, Mr. Chairman, members of the committee.

My name is Norm Shilling. I'm Carbon Leader for GE Gasification. I report into Houston. I'm the coal guy.

GE really appreciates the opportunity to testify here.

What we say at GE is that we are providing, I call it options. And our basic tenet is there really is no fundamental -- there is no fundamental silver bullet to solve our energy challenges.

It's likely there never will be. We believe we are going to need an array of various technologies, both on the renewable side, natural

gas, nuclear, and coal.

And I come from the coal tribe at General Electric. And, of course, these are all products and technologies that we provide to give our customers the options and to deal with the kinds of strategies, develop the strategies that are necessary to meet our environmental and our energy challenges.

Coal is under a lot of pressure, and I think we see it all in the newspapers. Detractors would, in some cases, rather that there be no coal whatsoever, no new coal plants.

And the statistics are appalling. We've run these numbers ourselves. And since 2001, there have been some 177 coal projects that have been canceled, totaling about 87 gigawatts. And much of that has been, of course, in response to the uncertainty that we are dealing with in carbon policy, carbon regulation.

And we say we need to move forward with coal as one of the options, because it is a very significant resource that we can draw on to deal with, of course, the volatility and to not have to buy energy and fossil from those people that don't really like us.

So climate change requires that we use coal

in a different manner for it to be environmentally acceptable. We believe that there is a pressing need for, what we say, "a new face of coal" based on a fundamental shift of technology that is going to break the long-held perceptions about coal.

IGCC is such a technology. It is ready for carbon constraints. Today, we have some 33 plants that are capturing carbon in the industrial world to make a variety of products from coal. That, for example, would be clean fuels, methanol, acetate. And we have, of course, experience from those plants with capturing carbon.

We do it from a range of 50 percent up to 90 percent carbon capture, and that is very valuable and relevant experience which, of course, we will deal to where we are providing power from coal with carbon capture.

And, of course, carbon capture, we believe, is technologically ready today. When combined with sequestration, it offers a solution for coal necessary that we are going to need for achieving our climate-change goals.

IGCC with carbon capture can achieve parity with or even better than natural gas, advanced natural gas combined cycle gas turbines.

We have made significant investment at General Electric in IGCC, and especially in the development of a 630-megawatt standard plant, the kind that is being built today up at Edwardsport by Duke.

We have also invested in the development of what we call a carbon island, and that is available for -- it is commercially available for either greenfield or retrofit to IGCC facilities to achieve natural gas combined cycle carbon emissions.

The proposed Fayette IGCC project, which we've been diligently pursuing, would be the sister of the Duke Edwardsport plant that is under construction. It is going to start up in 2012. It will set a new benchmark for low emissions coal generation.

That particular plant will consume less water. It is going to produce useful byproducts versus waste from the combustion of coal. We believe that is the new face of coal -- making the change to the new technology that is going to take us through the rest of this century.

The Fayette plant that we are pursuing would take the next step. It would capture CO2 right from the start of operations, and it would be delivered to

a Pennsylvania network, sequestration network.

As it has been said before, the Commonwealth is blessed with resources, and those are both coal resources and sequestration resources.

The DCNR study that was issued on May 1 found there is very large capacity. The geologic formations could support development of a sequestration network. It has the capacity potentially to store 88 billion metric tons of CO2 in saline aquifers -- estimated capacity for the lifetime of 898 500-megawatt plants. That's a lot of plants, hope they could all be IGCC plants.

The next step, of course, for the DCNR is really to assess the risks and requirements for safe geologic storage. In advance of that report, though, it's worthwhile noting that CO2 has been injected safely and has been operating for many years.

The Sleipner project in Norway in 1996, the Salah project in Algeria in 2004, and the Snøhvit-StatoilHydro project in the Barents Sea that began operation in 2008, they have an accumulative operating experience of 19 years, no unintended leakage.

CO2, again, is widely used in enhanced oil recovery. Eighty projects, 13,000 wells, and

53 million tons of CO2 a year is being injected for enhanced oil recovery.

I want to make the point, it all depends on good site selection. That includes good and secure impermeable barriers to CO2 migration.

Site characterization needs to be comprehensive, site monitoring and validation, safe operation of the sequestration facilities, and coupled with implementation of the remedial measures.

You are going to go through a failure modes and effects study that is going to say, here are all the possible things that could happen and here is how I'm going to mitigate that; here's the cost and here's the steps I would take to eliminate that.

But we have combined in an alliance with Schlumberger. They are the experts in CO2 sequestration and subsurface geology. And we have worked closely with Schlumberger to make sure that our carbon island that the CO2 that we are going to deliver to a network will be of sufficient quality and reliability and availability that will ensure there will be proper interoperability of both the sequestration facility and the power plant.

I think that's very important from the

commercial side, to make sure that they are going to be able to operate satisfactorily together. And that is primarily what needs to be demonstrated.

We've done the carbon capture; we do that. The sequestration has been performed. Now we need to link the two of those together to make sure that that can be done satisfactorily with high availability.

Fayette is going to require an investment of approximately $2 1/2 billion. That is for a reference plant operating at 60-percent carbon capture.

It's a significant, of course, challenge in today's economic environment to come up with that kind of capital, and, of course, with the capital market problems that we're dealing with.

So everything that can be done to foster those kinds of investments and reduce the risk and to provide, I'll call it an appropriate place that will foster these kinds of investments is needed.

As a pioneer CCS project, the project will qualify for a variety of Federal stimulus and energy bills.

Just let me say that the clock is ticking. I mean, there is Federal money that is already out there, and I'll give you one example -- the

investment tax credit, and it's significant.

As a matter of fact, the Duke project in Edwardsport went forward, was able to go forward because of an investment tax credit from the Energy Act of 2005. Now that particular project is getting $133 million.

And now starting, and I guess ending in November, we now have a new investment tax credit bid period that is going to be available for up to $416 million in investment tax credits.

So I think that is an important source of funding that brings a significant benefit, not only to being able to get the project to go forward, but that is going to be a funding, because of the way the AEPS is written, that will be a benefit to the ratepayers in Pennsylvania.

So we would dearly hate to see the windows close and that this bill get deferred, and then we'll be looking at all those projects that we wish we had been able to pursue.

So in addition to environmental benefits, the Fayette would keep money and jobs here in the Commonwealth. It will consume 1.6 million tons of coal a year, about $80 million at $50 a ton. Construction will take about 3 1/2 years. Labor will

peak at 2,000 jobs, an average of about 900 through the 3 1/2-year period.

And the Fayette project and IGCC project of that scale would create job benefits and extend really throughout the Commonwealth economy: 13,219 direct job-years, with $800 million labor income through the construction period; with indirect and induced effects, some 36,000 job-years, with $1.9 billion of labor income; ongoing employment of 270 direct jobs; and with indirect and direct multiplier effects, about 1,260 total jobs. That is significant.

And I think something to be sought for is what you are going to receive, what is the benefit going to be for a new coal project of the scale of a Fayette or an IGCC reference plant.

So the point I want to make, and I think we're all aware of this, without pioneer projects like Fayetteville -- the veil will move forward with lower carbon coal and especially with carbon constraints -- the value of Pennsylvania's coal resources is going to diminish.

Without commercial demonstration and proof of CCS viability, new coal plants will just not be an option. Coal demand will fade. Jobs from mining,

transport, plant operations, and the manufacture of coal-related projects that, for example, go into the plant, and there are many of those that are actually manufactured in Pennsylvania, we are going to wind up with those values being greatly reduced. And we can avoid this outcome and instead expand economic benefits from coal while using it in an environmentally acceptable manner.

In conclusion, GE commends Pennsylvania and the sponsors and the supporters of House Bill and Senate Bill 92 for their effort in establishing a framework for this continuing use of coal in a manner that is consistent with addressing climate change, addressing our energy needs, building our energy security, and by which coal, we believe, can remain a vital part of Pennsylvania's future.

So thank you for your attention. I look forward to your questions.

CHAIRMAN GEORGE: The gentleman has concluded?

DR. SHILLING: I have concluded.

CHAIRMAN GEORGE: Okay.

Any questions?

The Chair now recognizes the gentleman, Mr. Seip.

REPRESENTATIVE SEIP: Thank you, Mr. Chairman. I'll be very brief.

(Microphone interference.)

CHAIRMAN GEORGE: I apologize. We're wondering who is attacking us back here.

REPRESENTATIVE SEIP: Do you want me to try that one? Okay.

CHAIRMAN GEORGE: You may proceed, my good friend.

REPRESENTATIVE SEIP: Thank you, Mr. Chairman. I'll be very brief.

If I heard your testimony correctly, without House Bill 80, we are going to recover less coal. The coal that we do recover will be exported more often. We are going to lose jobs and Federal dollars.

And if I can go back to what Secretary Hanger had said about exporting that $700 billion overseas, we will be less energy independent, and our national security, keeping in mind that we are the most deployed National Guard unit in the country, our Air Guard and our Army National Guard, will be reduced.

Is that pretty much a fair account of what I heard?

DR. SHILLING: I think that hits on all the points. I think that's the concern.

I mean, it winds up in our -- you know, if you extrapolate what this means, with all those examples of cancellations and, of course, of coal plant cancellations, the value resource in the ground just diminishes.

The point, another kind of example is that, you know, for example, Australia does value, of course, its coal resources very highly. And Australia has made a significant investment and is providing significant incentives to be able to move coal with carbon capture forward. And that, they feel, is essential for them to be able to demonstrate that, yes, you can use our particular coal, you know, for export reasons and that those countries, for example, the shoreline along China and Japan, are going to be able to continue to use their coal and be able to then deal with potential or likely future carbon constraints and carbon price.

REPRESENTATIVE SEIP: Thank you for your testimony.

Thank you, Mr. Chairman.

CHAIRMAN GEORGE: Any other questions?

Just one final question, if you will.

Oh, the gentleman, Mr. Hutchinson. I beg your pardon.

REPRESENTATIVE HUTCHINSON: Thank you.

I just wanted to follow that up and ask you, you were talking about how important it is to pass House Bill 80. I want to clarify that or have you clarify the fact or, you know, whichever way you think.

If we were to decouple this bill -- I think there are two major subject areas in here. There is one about increasing the solar and wind requirements, and then there is another section that has to do with carbon sequestration.

If we were to cut that in half, would you like to see the carbon sequestration part done, and would that on itself promote the coal industry using our natural resources, keeping the value of our coal assets where they belong? Is that---

DR. SHILLING: I believe it would.

REPRESENTATIVE HUTCHINSON: Okay. I just wanted to clarify that. We don't need the whole bill to do that. We need part of the bill to do that.

The other stuff is, I think, a totally different subject and really should be in a separate bill. But thank you.

CHAIRMAN GEORGE: Just one final question, if you will, Doctor.

What steps will GE take to reduce or eliminate water pollutants that are emitted from this plant?

DR. SHILLING: The plant that we are developing for Edwardsport will be a zero liquid discharge plant. So there will be no waste coming out of it from the water side.

CHAIRMAN GEORGE: I thank the gentleman for his testimony. You may stand down.

DR. SHILLING: Thank you.

CHAIRMAN GEORGE: The next individual that will be testifying is the gentleman, Mr. Mike Welsh, the International Representative of the IBEW.

Welcome, sir.

MR. WELSH: Thank you.

Good afternoon, Chairman George, Chairman Hutchinson, and other members of the House Environmental and Energy Committee.

My name is Mike Welsh. I'm here today on behalf of the International Brotherhood of Electrical Workers. I thank you for the opportunity to come before the committee today to offer our views on House Bill 80.

House Bill 80 attempts to address several issues of interest to the IBEW. I do not claim to be a scientist or an expert in climate change, but I have spent over 32 years inside the electric utility industry. I know the issues before us are complex and complicated.

We need a commonsense approach as we move forward in the energy industry on how we choose to generate and transmit power to provide safe and reliable service to the Pennsylvania consumer.

House Bill 80 adds the definition of "Tier II alternative energy source" in the electric Alternative Energy Portfolio Standards Act of 2004 to include electricity generated by a facility fueled by coal or gas that captures and permanently sequesters carbon dioxide.

It would also increase the Tier II share of energy from 10 percent to 13 percent to create incentives to encourage investment in the carbon capture sequestration technology, CCS.

The IBEW strongly favors a national approach to climate change regulation, such as a cap-and-trade program that provides significant incentives for the deployment of CCS technologies.

We and all other unions in the AFL-CIO

supported the compromise Bingaman-Specter climate-change bill in the 110th Congress.

We do not believe that having a patchwork quilt of State and regional cap-and-trade programs will help jobs or the economy. Climate change is a global problem, and we need a national solution that provides a level playing field for all energy sources.

The IBEW is in support of advancing carbon capture and storage technologies, and recently, along with the United Mine Workers and the Industrial Union Council of the AFL-CIO, released a study by BBC Research and Consulting of Denver, Colorado, on the national economic and job benefits of aggressive programs to deploy advanced coal generation with CCS technology. That full report can be found at the link below.

The BBC study examined three different levels of commercial deployment of advanced coal units with CCS technology at 20, 65, and 100 gigawatts. One hundred gigawatts is roughly one-third of the nation's current coal-generating capacity.

BBC also estimated the economic benefits associated with two types of individual plants:

integrated coal gasification combined cycle units, IGCC, and supercritical pulverized coal units with CO2 removal technology.

BBC estimates that construction of a single 540-megawatt IGCC plant with CCS would generate between 3,300 and 9,000 job-years of direct and indirect employment during a 4-year construction period.

The higher number of 9,000 jobs is for the total direct plus indirect employment after accounting for multiplier effects. A job-year is one job for one person for 1 year.

The same IGCC plant would create between $507 million of direct economic output and $1.4 billion of total direct and indirect economic output over a 4-year construction period.

Household incomes would increase by $188 million to $478 million over the 4-year construction period. Again, the larger figure includes the multiplier effects.

BBC also estimates job and economic impacts for long-term operation of IGCC plants with carbon capture and storage. The annual direct estimate is 245 jobs and the direct and indirect estimate is nearly 1,200 jobs.

If we constructed 20 IGCC plants in Pennsylvania, roughly one-half of our current coal-based generating capacity of 20,500 megawatts, we would create between 5,000 direct and 24,000 total permanent jobs.

The above possibilities have given the IBEW reason to support initiatives that will help to accelerate the commercialization of CCS technologies.

One of the hurdles to overcome in order to move forward with specific projects is the need to address liability for storage of liquid carbon.

House Bill 80 addresses the liability of carbon storage, having the Commonwealth assume long-term liability risks for captured and stored carbon.

The IBEW supports alternate energy and wants to see it continue to grow to be a larger part of the generation mix in the future.

Our members are actively involved on many fronts with the manufacturing, installation, and maintenance of wind and solar facilities, as are other international unions.

The IBEW has concerns with the increases in the Tier I share of energy from the 8 percent to 20 percent. Our concerns are in regard to the large

percentage of the generation mix being forced into higher-cost production methods, which would be setting us up for an increase in energy prices that we don't think we can afford.

We need to be assured we are going to be able to meet the 2018 goals before we set goals for 2026 that may not be obtainable.

It is imperative to keep in mind capacity factors for wind and solar are not great enough that they can be seen as a reliable energy source and must be backed up with other generating capacities such as a gas-fired generation plant.

Currently, our electric generation mix breaks down to approximately 55-percent coal, 35-percent nuclear, 6-percent gas, 1-percent oil, and 3-percent hydro and renewables.

We need to be aware of the costs associated with moving the current mandates, which total 18 percent in 2018, to a new level of 33 percent in an 8-year time span by 2026.

If our goal is to reduce carbon emissions, we should be setting the limits we want to meet and let the market decide what generation makes sense.

We must decide if we are going to keep Pennsylvania electric generation competitive both

in State and out of State.

We must decide if we are going to have energy costs that will attract business to our State or make them look elsewhere.

As I stated early, a commonsense approach must be taken to address these complex and complicated issues, and the IBEW is going to work with all stakeholders to come up with commonsense solutions.

I thank you again for the opportunity to come before the committee today.

CHAIRMAN GEORGE: I thank the gentleman for his testimony.

Are there any questions? If not, thank you, sir.

MR. WELSH: Thank you.

CHAIRMAN GEORGE: Now, we have one testimony yet, but at this time I'll make you all aware that we have received written testimony from the following organizations:

• Andrew Place, Research Fellow, the Department of Engineering and Public Policy, Carnegie Mellon University.

• Douglas Biden, President, and Terrance Fitzpatrick, General Counsel, Electric Power

Generation Association.

• The gentleman, George Ellis, from the Pennsylvania Coal Association.

• We have a statement by Green Energy Capital Partners.

• And Maureen Mulligan, the Solar Alliance.

They will be included with this testimony.

And now the committee will welcome our final testimony, which is the gentleman, Mr. Nathan Willcox, Energy and Clean Air Advocate, PennEnvironment.

Thank you very much for attending. You may commence.

MR. WILLCOX: Thank you, Chairman, and thank you to the members of the committee for giving me the opportunity to testify today.

My name is Nathan Willcox. I am the Energy and Clean Air Advocate with PennEnvironment. PennEnvironment is a statewide environmental advocacy organization with roughly 15,000 citizen members across Pennsylvania.

My testimony today represents the view of PennEnvironment on House Bill 80, but also the view of the Sierra Club's Pennsylvania Chapter, Clean Water Action and Clean Air Council, as well.

I will not read through all of my testimony, but I'll summarize some of the important pieces.

To summarize our organization's position, we definitely believe that there is tremendous environmental and economic benefit to be gained by advancing clean, renewable energy in Pennsylvania, especially to enable significant cuts in global warming pollution.

In this same vein, our groups believe that Pennsylvania cannot afford to be promoting new sources of global warming pollution, which is the main reason why we oppose House Bill 80 in its current form.

As written, the language in House Bill 80 dealing with carbon capture and sequestration could incentivize the construction of new coal-fired power plants whose pollution might never be sequestered, adding significantly to Pennsylvania's global warming emissions.

Because of this as well as fiscal concerns with how House Bill 80 advances carbon capture and sequestration, our organizations oppose House Bill 80 in its current form and will continue to do so until a key set of amendments are made.

These amendments include granting

Alternative Energy Portfolio Standards credits for CCS only when a facility's pollution is actually sequestered, and shifting tort liability for sequestered carbon dioxide to the utilities and generators or private entities operating the sequestration network.

Our organizations have worked with the Natural Resources Defense Council, an organization that was mentioned earlier and that I'll come back to, to write such amendments for Legislators' consideration, and we have delivered this amendment language to Representative Vitali.

We do thank Representative Vitali for making some changes to the legislation based on our concerns, but the core flaws to which we object still remain.

I will skim over the section about how we support renewable energy. It should come as no surprise that as environmental organizations, we definitely support the State increasing the State's Alternative Energy Portfolio Standards Tier I requirement.

There would be huge environmental benefits that were mentioned earlier. There are also huge economic benefits. Hundreds of jobs have already

been created in green energy industries in Pennsylvania and hundreds of thousands more could be created. If the State takes the right steps in increasing the Portfolio Standards Tier I requirement, it would be a key inclusion in that step forward.

Despite, though, the benefits of the sections of House Bill 80 that increase the Alternative Energy Portfolio Standards Tier I requirement and the solar-share requirement, there are serious environmental and fiscal risks posed by the language dealing with carbon capture and sequestration within House Bill 80; most notably, the potential to incentivize new sources of global warming pollution.

To be clear, the goal of carbon capture and sequestration -- the capture and permanent storage of global warming pollution to prevent such pollution from escaping into the atmosphere and warming the planet -- is something that our organizations support. Coal-fired power plants are the largest source of global warming pollution in Pennsylvania and nationwide.

I do, though, want to push back on the notion that CCS is absolutely necessary to achieve

the science-based pollution reduction targets called for by scientists.

Several studies have documented how we can cut pollution to the levels that scientists say are necessary to avoid the worst consequences of global warming without the use of CCS technology.

In March, for instance, Greenpeace and the European Renewable Energy Council released a report that shows how the United States can cut global warming pollution from current levels by 85 percent by 2050 without carbon capture and sequestration, and actually do it at half the cost and with twice the job creation of what it would take to achieve these reductions with carbon capture and sequestration, nuclear power, and other nonrenewable energy sources.

That said, our organizations do acknowledge that if CCS ends up working on a commercial scale for coal-fired power plants, it will certainly make the fight against global warming a good deal easier.

Accordingly, our organizations applaud the bill's supporters for their interest in establishing a viable carbon dioxide sequestration network in Pennsylvania, and our organizations do support this broad goal.

However, the fact is that no one has yet developed or deployed CCS at a coal-fired power plant at scale, and we don't know whether or not a sequestration network will be functionally or economically viable in Pennsylvania.

Given this, it is critical that we promote CCS in a way that acknowledges that we are trying to accomplish something very ambitious that has never been done before, and there is a very real possibility that it won't work in Pennsylvania.

From this perspective, there are two critical flaws with the way in which House Bill 80 seeks to advance carbon capture and sequestration.

First, in the event that a viable sequestration network is not developed, coal-fired power plants that installed carbon capture technology would still receive credit under the State's Alternative Energy Portfolio Standards under House Bill 80.

In other words, plants could be receiving credit for capturing and sequestering their global warming pollution without actually sequestering their global warming pollution.

In the worst-case scenario, this could incentivize the construction of new coal-fired

power plants under the AEPS that don't actually sequester their global warming pollution.

From the environmental perspective, this is a critical flaw, because every new coal-fired power plant that doesn't sequester its global warming pollution creates new pollution equivalent to adding hundreds of thousands of new cars to the road.

Broadly, our organizations suggest that the State should focus first on establishing a viable sequestration network, and then, only after such a network is in place, offer AEPS credits or other incentives for carbon capture technologies that could drive the construction of new coal-fired power plants.

Our organizations respectfully request that House Bill 80 be amended so that AEPS credits are awarded to power plants with carbon capture technology only when those facilities' global warming pollution is actually sequestered.

Second, rather than requiring that the utilities and electric generation facilities that created the global warming pollution remain responsible for its sequestration, House Bill 80 would have the State assume liability for the pollution sequestered by the first facilities to use

CCS technologies.

No one is sure how much liability for sequestration sites will cost, and it sets a poor precedent, especially in today's economic times, for the State and Pennsylvania taxpayers to be assuming this liability.

If the estimated cost of such liability for sequestration sites is indeed small, then we question the need for the State to assume this liability.

Our organizations respectfully request that House Bill 80 be amended to shift tort liability back to the utilities and generators or private entities operating the sequestration facilities.

Because of these and other concerns with the carbon capture and sequestration language within House Bill 80, our organizations have joined with the Natural Resources Defense Council in opposing this language in its current form.

I know that George Peridas's name was mentioned earlier from the Natural Resources Defense Council. I'm on the phone with a guy every other day about this legislation. They are in opposition to this legislation despite their enthusiasm about carbon capture and sequestration.

We are very interested in working with

Legislators to address these concerns, and as was previously mentioned, we have submitted proposed amendment language to Representative Vitali.

I again thank the committee for the opportunity to testify today, and I would be more than happy to take any questions.

CHAIRMAN GEORGE: You have completed your testimony?

MR. WILLCOX: I have.

CHAIRMAN GEORGE: Thank you.

Questions?

The gentleman, Mr. Vitali.

REPRESENTATIVE VITALI: Thank you, Mr. Chairman.

And thank you, Nathan Willcox, for all your good work on the issue.

I want to focus in on the issue of REC credits and not awarding them unless there is actual sequestration.

You heard the testimony of Dr. Shilling with regard to, I think it was a $2.3 billion investment, and one of the reasons for taking that investment would be the receipt of REC credits.

Do you have any reason to believe or have you had any discussions with companies like GE or

others that would indicate that they would be willing to invest in CCS technology in Pennsylvania if they would not get REC credits in the event that the State's plan was not in operation, the sequestration network was not in operation?

Do you believe that they would undertake this risk if the bill were changed as you are suggesting?

MR. WILLCOX: Well, obviously I can't say what a company would do in a hypothetical situation, but---

REPRESENTATIVE VITALI: No, no, no. The question I'm asking is if you have had any discussions, if you know whether any company would be willing to make that $2.3 billion investment if the bill were changed as you are suggesting? That's my question.

MR. WILLCOX: Understood.

No, I have not. The colleagues that we work with at the Natural Resources Defense Council have had many conversations with firms that are involved in the carbon capture and sequestration deployment business. And I think beyond what they take away and our research, I think I would point out a couple of things.

One, again, we are very supportive of establishing the sequestration network, and I would offer that if Pennsylvania actually had the first up-and-running sequestration network, that, in combination with the legislation that is being considered in Congress right now to cap global warming pollution levels, if I'm a coal-fired power plant in Pennsylvania and I have that right there, which I know if I put the carbon capture technology on my plant, there's a place to store the technology, and due to the Federal legislation I'll have to pay for all the globing warming pollution that I'm emitting, that, to me, is a pretty strong incentive.

REPRESENTATIVE VITALI: Well---

MR. WILLCOX: Now, can I guarantee that GE would do that? No.

REPRESENTATIVE VITALI: Okay.

MR. WILLCOX: But I'm saying as far as other incentives beyond using our Portfolio Standards to potentially promote new sources of globing warming pollution, I would offer that as another perspective.

REPRESENTATIVE VITALI: Okay.

Let me talk or refer to the testimony of Acting Secretary Quigley when he talked about the timeline.

You are suggesting that the State have its carbon capture and sequestration up and running before offering any REC credits. And you've heard the extensive time periods, the studies involved over several years, and beyond that, the construction timeline. And you also heard his testimony with regard to this has to be up and running by 2015 to sort of deal with this impending climate-change crisis.

What is your response to essentially what he is saying, that we have to be moving forward with this and we don't have time to deal with putting the sequestration network up first before we bring these companies online?

How would you respond to Acting Secretary Quigley's position here?

MR. WILLCOX: Well, I did mention in my testimony that there have been studies showing how we can achieve the global warming pollution reduction targets called for by scientists to avoid the worst consequences of global warming without carbon capture and sequestration.

So I guess I would first challenge, respectfully---

REPRESENTATIVE VITALI: Is that a scenario

without nuclear and without coal at all?

MR. WILLCOX: It phases---

REPRESENTATIVE VITALI: Is that the Greenpeace study that has no nuclear and no coal in our next several decades?

MR. WILLCOX: If not the next several decades, it is by 2050, yes, that we would have to phase them out.

REPRESENTATIVE VITALI: Okay.

MR. WILLCOX: But it is not tomorrow, by any means, that we are talking about phasing those resources out that we are obviously dependent on today.

REPRESENTATIVE VITALI: Okay.

MR. WILLCOX: So, one, I would challenge the assumption that we need to be establishing carbon capture and sequestration to do what the scientists say are necessary, because there is data that suggests otherwise.

But again I come back to, from an environmental perspective, if the goal of this is to cut global warming pollution, it is tough to see how new coal-fired power plants that don't sequester their pollution fit into any equation achieving those pollution reductions regardless, and that's our

fundamental point, is that the way this legislation is written, it could incentivize new coal-fired power plants, each of which creates enough global warming pollution equivalent to adding hundreds of thousands of new cars to the road.

So we are environmental organizations. I'm not sure how we can possibly support that idea.

REPRESENTATIVE VITALI: Got you.

The liability issue. There has been testimony that there are now in the marketplace insurance companies that -- and I know Zurich is one of them; I don't know if that's been mentioned specifically today -- that will in fact insure the risk of malfunctioning in a carbon sequestration facility.

Does the fact that this is an insurable risk change your view as to the liability issue?

MR. WILLCOX: No.

We still think that it's a risk that the State and Pennsylvania taxpayers should not be assuming, especially because a lot of the proponents of CCS, and especially the folks who have done sequestration in other fields, be it oil and natural gas recovery or other fields, say that actually the liability costs for them haven't been

that great.

And so if it's not that great, as a lot of its proponents suggest, then we don't see the big deal of actually having the folks who created the pollution in the first place assuming that liability as opposed to the State.

REPRESENTATIVE VITALI: And you are aware that the bill authorizes the State to charge depositors of CO2 costs for insurance with regard to this risk?

You are aware of that?

MR. WILLCOX: We are aware of that, yes.

REPRESENTATIVE VITALI: Okay. Thank you.

MR. WILLCOX: Thank you.

CHAIRMAN GEORGE: I thank the gentleman.

The gentleman, Mr. Hutchinson.

REPRESENTATIVE HUTCHINSON: Thank you.

I just have to go one direction that we haven't really touched on today, although I will say it is interesting that our last three testifiers seemed to be saying that these are two monumentally different things we are dealing with -- sequestration and then the AEPS -- and from different angles, there seems to be opposition to connecting those.

But be that as it may, I really wanted to

ask you about another non-global warming energy source and wanted to know where you folks come down.

There is, I think, substantial interest within the General Assembly in expanding nuclear energy, and I wanted to know where you as an organization stand on the expansion of nuclear electric production in Pennsylvania.

MR. WILLCOX: Speaking for PennEnvironment, we are opposed to the expansion of nuclear power and for two reasons.

While its proponents definitely point out that it creates less global warming pollution than coal or even natural gas, we see nuclear power as having two fatal flaws.

One, the waste issue. It still creates waste that we don't have an adequate plan to actually address. This waste is waste that remains lethal for generations to come. And there are obviously plenty of resources out there that don't create such waste.

The second flaw that we see with nuclear power is the cost. It's no secret that for decades, the nuclear industry has depended on billions and billions of dollars of government subsidies, most notably through the Price-Anderson Act, by which

taxpayers would be liable if there were some nuclear accident as opposed to the nuclear facility itself.

And so we do not feel that if we have so many dollars to get us out of this mess, that nuclear power is the wisest use of those dollars.

CHAIRMAN GEORGE: Has the gentleman concluded?

REPRESENTATIVE HUTCHINSON: Yes.

CHAIRMAN GEORGE: I thank the gentleman for his testimony.

MR. WILLCOX: Thank you, Chairman.

CHAIRMAN GEORGE: I thank all of those that have presented testimony in regard to House Bill 80.

I thank those in attendance.

I thank these committee members that consistently show a very, very zealous need to help Pennsylvania in every way.

And if there is no other business before this committee---

REPRESENTATIVE HUTCHINSON: Can I make a comment? There's something I want to put on the record.

CHAIRMAN GEORGE: The gentleman, the Co-Chairman, wants to put something on record.

Short.

REPRESENTATIVE HUTCHINSON: Very short.

Just to clarify, a question was asked earlier about condemnation language, and there is condemnation language in this bill. I did raise it with the DCNR Secretary afterwards, and I will be pursuing that further.

But I just want it on the record that that language is in the bill today. He said he was unaware of it.

Thank you.

CHAIRMAN GEORGE: Let it be acknowledged that the gentleman has now placed on record that he reads something that somebody hasn't read.

If there is no other business before this committee, we stand adjourned.

(The hearing concluded at 2:50 p.m.)

SUBMITTED WRITTEN TESTIMONY

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DOUGLAS L. BIDEN, President, and TERRANCE J. FITZPATRICK, General Counsel, Electric Power Generation Association, submitted the following written testimony:

DATE: May 20, 2009
To: Members, House Environmental Resources and Energy Committee
FROM: Douglas L. Biden, President
Terrance J. Fitzpatrick, General Counsel
RE: House Bill 80 Printer's No. 1000

On May 21, 2009, the House Environmental Resources and Energy Committee will hold a hearing on House Bill 80, Printer's No. 1000. This Bill would amend the Alternative Energy Portfolio Standards Act ("AEPS Act") to increase the mandated amounts of Tier I renewable energy from 8% of electricity consumed by customers to 20% in the years 2021 to 2026. It would also increase the solar energy mandate from .5% to 3% over the same time frame, and create an additional specific mandate of up to 3% by 2015 for coal plants using carbon capture and sequestration technology.

The companies that are members of the Electric Power Generation Association ("EPGA") own most of the electric generating capacity in Pennsylvania. These companies are critical to the Commonwealth's economy, and provide family-sustaining jobs to tens of

thousands of Pennsylvanians. EPGA has the following concerns about H.B. 80:

- While the original AEPS Act was intended to incent development of renewable energy, a dramatic increase in renewable energy mandates is likely to lead to dramatically higher electricity bills for customers. For the foreseeable future, renewable energy is likely to remain more expensive than electricity from other generation sources. In addition, since renewable sources such as wind and solar only produce electricity when the wind blows and the sun shines, they create a need for additional back-up resources, such as natural gas-fired generating plants, that must also be paid for.

- The primary purpose of those advocating additional mandates for renewable energy in Pennsylvania is to combat climate change. This issue is appropriate for federal action because the federal government can set national standards and address the rapid growth in emissions from developing countries

such as China, which is now the world's largest producer of carbon dioxide emissions.

- Of the policy options for combating climate change, mandating more renewable energy is likely to be the most expensive. It would be more economical for the federal government to establish a "cap and trade" system to limit greenhouse gas emissions, and then allow different technologies, including conservation technologies, to compete to meet these standards at the lowest cost.

- Customers will benefit if investors, rather than government policymakers, make decisions about what types of generating plants can most economically serve customers while meeting environmental requirements. If investors make bad decisions, they bear the consequences of those decisions. If government policymakers make bad decisions, electricity customers bear the consequences and will pay higher prices.

- Many lawmakers have expressed support for building more nuclear generating plants.

However, if H.B. 80 were approved, 33% of the electricity consumed in Pennsylvania would be mandated to come from Tier 1 and Tier 2 alternative energy sources by 2026. This means that potential investors in new nuclear plants in Pennsylvania must consider that one-third of the market will be off limits to them. This discourages investment in nuclear plants and other generation technologies, some of which may not exist yet, that are not included in the definition of alternative energy sources.

- Policymakers in 2009 cannot accurately predict what technologies will exist or be economically viable in the years 2021 to 2026. For example, the development of the Marcellus Shale natural gas reserves was not anticipated a decade ago.

- The economic benefits of requiring increases in renewable energy are overstated. Government mandates ar not the source of economic prosperity. Moreover, any increase in jobs in the renewable energy sector is

likely to be offset by job losses in forms of generation that are displaced.

* * *

GEORGE ELLIS, President, Pennsylvania Coal Association, submitted the following written testimony:

Thank you for the opportunity to submit written comments on behalf of the Pennsylvania Coal Association (PCA) regarding the provisions of HB 80.

PCA is a trade organization representing bituminous coal operators -- both underground and surface -- as well as other associated companies whose businesses rely on a thriving coal economy. PCA member companies produce over 85 percent of the bituminous coal annually mined in Pennsylvania.

Profile of the Pennsylvania Coal Industry

The Energy Information Administration (EIA) estimates the demonstrated US coal reserve base at 496 billion tons distributed geographically among

31 states; with 27 billion tons in Pennsylvania. At current consumption levels, coal supplies will be available for at least the next 250 years. In fact, on an energy equivalent basis, the 5,441 quadrillion BTUs of US coal surpasses the 4,446 quadrillion BTUs of Middle East oil.

Pennsylvania is the fourth leading coal producing state, mining 68 million tons last year. Almost 80 percent of this output came from 39 underground mines and the remainder from 377 surface mining and reprocessing sites.

In addition, the **Pennsylvania mining industry** constitutes a major source of employment and tax revenue. Last year, it **created 49,100 direct and indirect jobs with a total payroll in excess of $2.2 billion. Taxes on these wages netted over $700 million** to the coffers of federal, state and local governments.

The steam coal market is the largest customer for Pennsylvania coal. About 75 percent of Pennsylvania's annual bituminous coal production goes to the electricity utility sector.

Coal has been and will continue to be the major fuel of choice for electricity generation. Fifty percent of the United States' electricity is generated by coal and coal accounted for 56 percent of the total amount of electricity produced in Pennsylvania last year.

In addition, coal is by far the least expensive fossil fuel on a dollar per million BTU basis for electric generation, averaging almost one-fourth the price of natural gas ($2/mmBTU versus $7/mmBTU).

Pennsylvania's reliance on coal-fired electricity has made the Commonwealth one of the largest exporters of electric power in the US. About 30 percent of the electricity produced in Pennsylvania is exported to other states.

As coal use has increased, technological advances have allowed it to be processed in a cleaner manner. For example, from 1970 to 2009, coal generation has increased by 225 percent while emissions of regulated pollutants decreased by 77 percent.

HB 80 consists of two separate and distinct issues,

both of which would have a profound impact on the generation of coal-fired electricity in Pennsylvania and a significant impact on coal production and employment.

One part of the bill would dramatically increase the Tier I requirements of Pennsylvania's Alternative Energy Portfolio Standards Law (AEPS), which would negatively affect the use of coal; the other would provide incentives to encourage development and commercial deployment of Carbon Storage and Sequestration Technology (CC&S), which would positively affect coal use.

Customer Choice

In 1996, Pennsylvania enacted a law designed to deregulate the Commonwealth's electric generation market.

Dubbed the Customer Choice Act, the bill was intended to create a competitive generation industry and move the market from being regulator-driven to consumer driven. In effect, customers would be able to choose the source of their electricity.

Competition placed a premium on the cost and reliability of a given fuel. With coal being the most affordable and reliable energy source, PCA supported the Customer Choice Act as a means to increase coal use.

Competition assumes the existence of a level playing field on which various fuel options can compete equally on their merits. However, in recent years government has, through regulations, subsidies and mandates, again forced its influence on the market in a manner that skewed the playing field against the use of coal.

AEPS

Among the intrusions into the customer choice electric market was the 2004 enactment of Pennsylvania's AEPS.

Essentially, the AEPS requires Pennsylvania's electric utilities to acquire a minimum of 18 percent of their electricity by 2021 from two categories of energy sources -- 8 percent from Tier I resources, which are traditional renewable energy resources like

wind and solar; and 10 percent from Tier II sources, more unconventional "alternative" energy sources.

In addition, the AEPS requires 0.5 percent of the 8 percent Tier I source requirement to come from solar photovoltaic technologies.

HB 80 Amendments to AEPS

Under HB 80, the AEPS Tier I and II requirements would dramatically increase from 18 percent by 2021 to 33 percent by 2026.

Most of the increase is directed towards the Tier I category -- increasing the amount of electricity required of these sources from 8 percent to 20 percent, including an increase from 0.5 percent to 3 percent the amount of Tier I electricity that specifically must be produced from solar photovoltaic technologies.

Tier II increases from 10 percent to 13 percent by 2015, with the additional 3 percent set aside for plants that utilize CC&S technologies.

PCA opposes these amendments to the AEPS and, at the very least, views consideration of HB 80 at this time to be premature for the following reasons.

1. Will Current Targets Be Met?

- PUC Study

Under the existing AEPS law, the PUC is directed, by 2010, to conduct a study of the compliance status with the current targets and make a recommendation to the General Assembly regarding the merits of enacting additional compliance targets.

The Tier I renewable energy targets already established in the current AEPS alone will be challenging enough to meet.

Currently, less than 1 percent of all energy used by Pennsylvania homes, businesses and industries is obtained from solar energy. Can the existing 8 percent Tier I target be logistically met? If so, at what cost? Will it affect the Commonwealth's capability to

maintain a reliable electricity supply to meet future energy demands?

Other states that have enacted some form of Portfolio Standards do not have the special carve-out requirement for a percentage of electricity coming from solar PVs because it is too expensive. If it isn't affordable for other states, can it possibly be affordable for Pennsylvania?

The legislature obviously thought that these questions needed to be answered before any increase in the current targets were contemplated. That is why the provision requiring the PUC review as a prerequisite to further amendments was included in the law.

PCA strongly recommends that the PUC be allowed to conduct the required statutory study before any action is taken on this bill or prior to any increase in AEPS targets.

- DEP Report on Climate Change

Last summer the Pennsylvania legislature enacted Act 70 which, among other things, directed DEP to submit a climate change action plan to the governor and General Assembly by October 9, 2009.

The law also created a Climate Change Advisory Committee (CCAC) consisting of 21 members from the public and private sectors to help guide the Department in developing the plan.

Act 70 was a prudent attempt by the legislature to take a deliberate, "look-before-you-leap" approach in assessing the merits and impacts of a state response to the climate change issue. HB 80 is currently being analyzed by the CCAC to determine if it should be included in the response.

PCA believes that any consideration of HB 80 must be deferred until a full and complete assessment of its provisions is completed by the CCAC under the provisions of Act 70.

2. Cost and Supply Implications

Before we set in motion a mandate that will displace existing baseload coal-fired electric generation with new solar and wind units, the cost and supply implications must be fully analyzed.

Increases in electric rates will be substantial. An existing coal-fired power plant can generate electricity at a cost of about $30 per MWH. By comparison, that cost would double for power generated from wind (about $60 per MWH) and would be about 10 times the price from a solar PV unit ($327 per MWH).

HB 80 would force non-competitive electric rates on consumers at a time when there is mounting concern over the pending expiration of electricity rate caps and predicted rate hikes.

Not only would this be devastating to an already-shrinking manufacturing base, to cost-sensitive homeowners and to those who lost their jobs due to a gripping economic downturn, but the burden of escalating energy prices falls

disproportionately on the financially disadvantaged.

For example, a family whose income is between $30-50k per year spends 16 percent of their after-tax income on energy costs; a family with income between $10-30k per year spends 20 percent; for less than $10k per year the figure is 47 percent.

Overall, 61 million American households earn less than $50k each year and will devote an average of 18 percent of their after-tax income to energy.

Having a reliable (and affordable) source of electricity is a prerequisite to economic growth. How will an increased reliance on solar and wind (at the expense of coal-fired generation) affect the reliability issue?

Both solar and wind are intermittent energy resources. The capacity factor for solar PVs is 13 percent; for wind it is 27 percent.

What will be the extent of our backup power and at what costs? Any targets must be with due

consideration given to meeting future energy demand.

These questions must be addressed before any consideration of HB 80.

3. Barriers to Increased Use of Renewable Energy Resources (RER)

Both the EIA and DOE project renewable-generated energy (including solar and wind) to be only 12.5 percent of the US's generation by 2030, even with excessive government subsidies.

Among the impediments to increased use of solar are high initial system costs, ensuring equipment availability, developing a quality installation infrastructure and expanding distribution networks.

Moreover, Pennsylvania's climate is not as amenable for solar power as that in some other states. We are not a solar intensive state and do not have the same solar radiation as a desert state, for example.

Pennsylvania ranks 22nd among the states in wind power potential.

Against this backdrop, we cannot expect to achieve a 20 percent Tier I target by 2026.

There are currently a plethora of subsidies, tax credits and other incentive programs in place to help develop this fledgling renewables industry.

Available federal tax credits for solar and wind currently amount to a subsidy for these resources of about 2.1 cents/KWH.

Beyond the AEPS, Pennsylvania offers a number of programs to help build the RER industry:

> Alternative Energy Investment Fund (AEIF) which sets aside $100M to cover up to 35 percent of the installed cost of solar technologies for residential customers and small businesses; the $80 million economic development fund created as part of the AEIF; net metering regulations that enable owners of customer-sited distributed generation (such as

PV) to obtain retail credit from utilities for power produced on site; and Standardized Interconnection Rules that simplify and streamline interconnection for grid-connected distributed generation.

Even with these programs in place less than 1 percent of our electricity is generated by RER.

At what point does government make the determination that it is time for the resource to survive on its merits or that increased funding and mandates are insufficient to overcome the barriers to development in certain states?

4. Federal Renewable Energy Portfolio Act

Congress is currently working on a bill that would create a 15 percent RER Portfolio Standard.

This would be 3 percent less than the current AEPS and 18 percent less than what is proposed in HB 80.

Pennsylvania should not enact legislation that is over double the federal standard. It will put our

economy at a severe competitive disadvantage and cost us jobs.

CC&S Provisions of HB 80

Under HB 80 the state would be required to:

- Develop and operate a carbon dioxide sequestration network (CSN).

- Insure the operation of the CSN; plant owners would be immune from liability for carbon leakage.

As previously mentioned, the bill also creates a 3 percent set aside in Tier II of the AEPS for plants that utilize CC&S technologies.

With the exception of the 3 percent set aside, the CC&S provisions could stand alone on their merits.

PCA recommends decoupling these provisions from HB 80 and introducing them as a separate bill.

Development and deployment of CC&S technology will provide an option for building new coal-fired plants as the existing fleet is retired. As such, new technology would help the Commonwealth continue its reliance on a source of electricity that is affordable, reliable and indigenous to the state.

Therefore, PCA believes that efforts to encourage this technology are a prudent step in ensuring the continuation of coal-based power.

Conclusion

Some states are better equipped to produce renewable energy. Other states have less access to these resources and are heavily invested in other means of production.

Pennsylvania is a prime example of the latter. With 90 percent of its electricity produced by coal and nuclear (56 percent and 34 percent, respectively), Pennsylvania has a long history of maintaining a high level of electric reliability and has avoided the periodic blackouts and burnouts that have interrupted services and devastated economies in other regions of

the country.

Before we significantly alter this generation mix by requiring a state like Pennsylvania to produce 20 percent of its electricity from renewables, we need to ensure that this action will not upset our balance of power as a net exporter of electricity or jeopardize the affordability and reliability of our electricity deliveries.

Frankly, no assurances have been provided that Pennsylvania will meet its existing renewable targets in a timely manner. To increase these targets at this time by enacting HB 80 would be a recipe for economic disaster.

Thank you again for allowing PCA to offer these comments. I would be happy to meet with you at your convenience to discuss these issues in more detail.

HANDOUTS

* * *

ANDREW PLACE, Research Fellow, Department of Engineering and Public Policy, Carnegie Mellon University, submitted written testimony.

For testimony, see attached handout.

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JOHN CURTIS, Founder and CEO, Green Energy Capital Partners, LLC, submitted written testimony.

For testimony, see attached handout.

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MAUREEN MULLIGAN, The Solar Alliance, submitted written testimony.

For testimony, see attached handout.

I hereby certify that the proceedings and evidence are contained fully and accurately in the notes taken by me on the within proceedings and that this is a correct transcript of the same.

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Debra B. Miller, Reporter