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National Coal Council Meeting 05-17-2013

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NATIONAL COAL COUNCIL MEETING

HELD AT

THE FAIRMONT HOTEL

2401 M STREET, N.W., BALLROOM II

WASHINGTON, D.C. 20037

ON

FRIDAY, MAY 17, 2013

9:00 a.m.

Reported by: Jen Metcalf,  
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1 A P P E A R A N C E S

2

3 JOHN LONG, NCC VICE CHAIRMAN

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6 STUART DALTON

7 ALEX FASSBENDER

8 JANET GELLICI

9 RICHARD BAJURA

10 DON NEWELL

11 FRED MOORE

12 KEN NEMETH

13 SY ALI

14 GREG WORKMAN

15 FRED PALMER

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1 P R O C E E D I N G S

2 MR. EAVES: Good morning, ladies and  
3 gentlemen. My name is John Eaves and I'm chairman of  
4 the National Coal Council.

5 The Spring 2013 Meeting of the National Coal  
6 Council is hereby called to order. This morning, we're  
7 very fortunate to have a number of very special guests.  
8 We're pleased to welcome this morning the Acting  
9 Assistant Secretary of Fossil Energy, the Honorable  
10 Chris Smith. We really look forward to working with  
11 Chris as the Council moves forward with its work this  
12 year. Thanks for being here, Chris.

13 MR. SMITH: Thank you.

14 MR. EAVES: We also have some exceptional  
15 speakers on today's agenda. They are Fred Palmer, the  
16 chairman of the Council's Coal Policy Committee who  
17 will give us a summary of the recent council reports,  
18 as well as lay out the vision for coal well into the  
19 21st century. Christopher Ling, Booz Allen Hamilton,  
20 who will speak to us about the challenges presented in  
21 the cyber security sector of the economy. Don Newell,  
22 with the Kentucky Department of Natural Resources. And

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1 Fred Moore with Nuclear Alliance, who will speak to us  
2 about the interesting opportunities to marry  
3 technologies in nuclear power and the production of  
4 liquid fuels from coal.

5           We've also got to conduct some Council  
6 business today. I'm pleased to recognize Bob Wright,  
7 where's Bob, as the DOE's Office of Fossil Energy as a  
8 federal designated officer. Welcome, Bob. Appreciate  
9 you being here today.

10           So, as you can see, we've got a very full  
11 agenda this morning. This meeting is being held in  
12 accordance with the Federal Advisory Committee Act and  
13 the regulations that govern that act. Our meeting is  
14 open to the public. I'd like to welcome guests from  
15 the public who have joined us here today. An  
16 opportunity will be provided for the guests to make  
17 comments at the end the meeting.

18           Full and complete minutes of this meeting are  
19 being made, as well as verbatim transcripts. Therefore,  
20 it is important that you use the microphone when you  
21 wish to speak, and that you begin by stating your name  
22 and affiliation.

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1 Council members have been provided a copy of  
2 the agenda for today's meeting. I would appreciate  
3 having a motion for adoption of the agenda.

4 Do I have a second?

5 MS. GELLICI: The first is from Ram. I just  
6 need it for the record. I'm sorry. Ram, thank you.

7 Second?

8 MR. EAVES: All in favor?

9 MS. GELLICI: Mike Durham. Thank you.

10 MR. EAVES: All in favor.

11 (Chorus of ayes.)

12 MR. EAVES: Opposed?

13 (None.)

14 MR. EAVES: Thank you. Next, I'd like to  
15 announce the Secretary has appointed several new  
16 members of the Council. I'd like to introduce them now  
17 and ask them, if they're present, to please stand.

18 Phil Ren, Taider Corporation. Is Phil here?  
19 Desmond Chan, Bechtel Corporation. Desmond. Daman  
20 Walia, ARCTECH Corporation. Oh, none of our new  
21 members are here today.

22 You know, it's my pleasure to introduce our

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1 first speaker, the Honorable Chris Smith, Acting  
2 Assistant Secretary of Fossil Energy, which encompasses  
3 coal, natural gas and oil.

4           You know, prior to his appointment to the DOE  
5 in 2009, he served in several managerial positions in  
6 the private sector. Chris began his career in the Army  
7 as an officer with tours in Korea as well as Hawaii. He  
8 then worked for Citibank and JP Morgan in Emerging  
9 Markets.

10           Chris has a Bachelor's in Engineering from  
11 West Point and an MBA from Cambridge. Please welcome  
12 Chris Smith.

13           MR. SMITH: Well, thank you very much, John,  
14 for that kind introduction. And thanks to all of you  
15 for inviting me to come and speak before this group.

16           I've met many of you in various capacities.  
17 I was just in a conference in Pittsburgh where I got an  
18 opportunity to talk to many of you there. So, you  
19 know, for me this is always an opportunity to talk to a  
20 group of subject matter experts and decision makers  
21 like this, all kind of gathered together under one  
22 roof. So again, thanks for having me here.

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1 I got to spend some time with Bob Wright,  
2 who's helped me understand some of the things that this  
3 federal advisory can help us do within the Department  
4 of Energy. One thing I will say is I'm certainly no  
5 stranger to federal advisory committees. I've got a  
6 profound understanding of the things that groups like  
7 this will help the Department to do in our quest to  
8 serve the public mission.

9 One of the things that we've really  
10 emphasized in Department of Energy is, you know, we're  
11 the technology organization, we're responsible for  
12 developing the technologies that we're going to move us  
13 into the clean energy economy of the future. But if we  
14 don't do that hand-in-hand with the private sector, if  
15 we don't understand how the work that we do will impact  
16 the investments that companies make, then we're not  
17 going to be successful in getting the outcomes that we  
18 desire. So, this type of interaction is critically  
19 important to us and it's very valued by leadership at  
20 every level at the Department of Energy.

21 I know that you're not here for the money.  
22 Right? In terms of being part of the federal advisory

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1 committee. You're volunteering your time to serve your  
2 country in this capacity. So again, one of the main  
3 things I want to say here today is just simply thank  
4 you to this group as you kick off an important day of  
5 work.

6           So, for me personally, this is a really  
7 exciting time. I've been in this role for about a  
8 little -- I think about 75 days now. I previously was  
9 the Deputy Assistant Secretary for Oil and Natural Gas  
10 and I came into that job back in November of '09. And  
11 it's been a really exciting time for energy. You know,  
12 in my previous capacity, I was a federal official for  
13 the commission that was created by the president after  
14 the Deepwater Horizon disaster, the macondo blowout in  
15 the Gulf of Mexico. We've also seen a rapid rise in  
16 shale gas that's brought concerns about hydraulic  
17 fracturing, issues around flaring, international  
18 issues, LNG exports. So, lots of things happening very  
19 rapidly.

20           Certainly, the job that I ended up doing was  
21 very different than the job I thought I was taking when  
22 I came to Washington D.C. four years ago. And that

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1 continues now as I transition into this new role as the  
2 Acting Assistant Secretary for Fossil Energy.

3           So, this is a tremendously exciting part of  
4 the portfolio and one that the Department's going to  
5 care a lot about and one that's really going to be one  
6 of our focuses. So, I can say certainly that our new  
7 secretary, you know, as of yesterday, who is confirmed,  
8 Secretary Moniz, this is an area of particular concern  
9 to him, and particular knowledge as well. He  
10 understands this area, he understands the technologies,  
11 he understands the policies behind this. And he's  
12 going to have a real interest in what work are we doing  
13 here in DOE to make sure that we're moving this ball  
14 forward.

15           So, this is going to be, you know, a  
16 tremendously important mission. You know, back in  
17 November when I was at the presidential inauguration, I  
18 personally was excited to hear the president talk very  
19 directly not only about the challenges of climate  
20 change in a way that was very direct and unambiguous,  
21 but also about the role that the development of  
22 technology is going to place in making sure that we

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1 rise to that challenge, that we move forward, and that  
2 America takes a leadership role.

3           And I'll just read a quote from the  
4 president, at that speech. He said, "The path towards  
5 sustainable energy sources will be long and sometimes  
6 difficult. But America cannot resist this transaction,  
7 we must lead it. We cannot cede to other nations the  
8 technology that will power new jobs, new industries, we  
9 must claim its promise." So, that's what the president  
10 said back at his inaugural address.

11           And as I listened to those words, for me it  
12 was very clear that that ambition, that that goal that  
13 he had very unambiguously given to not only Department  
14 of Energy and the federal government, but to the  
15 nation, that the quest for carbon capture technologies,  
16 for sequestration technologies, the advances of  
17 technologies to utilize CO2 for beneficial causes, that  
18 was at the very center of that quest.

19           The clean energy economy of the future is  
20 going to be a carbon-constrained world. That's  
21 something that we know going forward. These are  
22 challenges that we have to rise to. Now, in the clean

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1 energy economy of the future, there are going to be  
2 winners and there are going to be losers. So, the  
3 winners are going to be those countries that develop  
4 the technologies, that innovate, that pioneer and sell  
5 those technologies to other countries. And the losers  
6 are going to be those countries that are buying those  
7 technologies from the winners.

8           And there's going to be that split. So, this  
9 is a time for us to rise to the challenge to make sure  
10 that we're doing everything that we can to make sure  
11 that we're on the right side of that equation, that  
12 we're developing these technologies right here in the  
13 United States, that the federal government is  
14 partnering with private sector partners to innovate, to  
15 demonstrate, and to move forward. And that's at the  
16 very center of our mission.

17           This administration has made an historic \$6  
18 billion investment in carbon capture and sequestration.  
19 And it's not a theoretical project; it's something that  
20 is making real impacts on the ground. And so this is  
21 actually a fun time for me to be transitioning into  
22 this job, because you know, the projects that we

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1 announced, you know, some time again, are now coming to  
2 fruition. Just last year -- last week, excuse me, I  
3 was down in Port Arthur, Texas for the ribbon cutting  
4 for the Air Products Project that's taking two steam  
5 methane transformers, converting or creating CO2,  
6 putting that into a pipeline and using it for EOR  
7 applications, which is really an historic project.

8           First of all, it came in -- on schedule and  
9 under budget. And we like under budget. Right?  
10 Particularly in this budgetary environment. So, I  
11 think we were able to work with that particular partner  
12 to apply things that we've learned in the lab and  
13 demonstrate them on the field. So again, on time,  
14 under budget and 700,000 work hours without a lost time  
15 incident. So, that was something that I was very proud  
16 to have the opportunity to congratulate, very directly,  
17 the construction managers who had their hands on that  
18 site and who actually made that happen. So, that was a  
19 great achievement.

20           But it's also showing that we can take the  
21 things that we're understanding in the laboratory,  
22 where the innovations that we're achieving not only at

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1 NETL, but also through our academic partners and  
2 through industry, and we're able to apply it. So, that  
3 was exciting.

4           On that same trip, I took a trip down to  
5 Thompson, Texas to the NRG project where they are doing  
6 a carbon -- a post-combustion CCS project, again for  
7 CO2-EOR, putting that into a pipeline and sending it to  
8 a field some 40 miles south of the project.

9           That was notable for a couple reasons.  
10 First, I found the business model to be really  
11 interesting. So, here NRG, they own the plant, they  
12 operate the plant, they're investing in the CCS and the  
13 capture technology. They're investing in the pipeline  
14 and they're also investing in the field. So, you've  
15 got a ring fence around the entire operation in this  
16 particular case. One single business model that is  
17 integrated from capturing the CO2 all the way to  
18 producing the oil.

19           The second thing that was interesting for me  
20 for that particular project, was the fact that the --  
21 when the original solicitation went out and it was won  
22 by NRG, the original specification for that plant was a

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1 60 megawatt flue gas stream that they were going to  
2 capture and turn into the CO<sub>2</sub>, put into the pipeline  
3 and put it into the ground and produce oil. And so  
4 when they went through the process of doing further  
5 engineering and design on that project and  
6 understanding some of the limitations of the pipeline  
7 network, and also understanding what they actually  
8 needed in the field to recover the volumes of oil that  
9 they were -- that they had predicted, they realized  
10 they had to go from 60 megawatts to 240 megawatts. So  
11 quadrupled the size of the capture project.

12           But at no additional cost to DOE. No  
13 additional cost to the taxpayer. Which shows for us a  
14 couple of things. The fact that we're working this  
15 business model to, I think, to effect. I think that we  
16 do have partners who are looking to make this work. And  
17 for us, it's encouraging that we're seeing that type of  
18 progress.

19           I also got the chance to go down to the  
20 Southern Kemper Project down in Mississippi, the IGCC  
21 Project, of which DOE's a partial investor, about 50  
22 percent complete. So, you know, again, as I kind of

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1 transition to this role -- and there are many other  
2 projects, I'm just going to mention the ones that I've  
3 actually seen with my own eyeballs, right, so that will  
4 limit it to what I've mentioned. And there are other  
5 projects which we all love. Right? So, if I didn't  
6 mention your project, it doesn't mean that we don't  
7 love it.

8           But those are the ones I've seen thus far.  
9 And again, you know, coming on board at a time in which  
10 these projects are actually hitting the ground, that  
11 we're making them operate, that's something that we'll  
12 be able to go back to the American public and say,  
13 "We're making progress with this investment. You know,  
14 we're taking these taxpayer dollars, we're investing  
15 them effectively."

16           And not only are we developing the  
17 technologies of the future that American businesses,  
18 the American economy are going to have the opportunity  
19 to sell to other countries, but we're also doing  
20 tangible things right here in the United States to  
21 increase oil production, reduce our reliance on  
22 imports. So, that's tremendously important, it's at

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1 the very center of our all of the above mission,  
2 tremendously important mission.

3           You know, so I came from industry, I was at  
4 Chevron for 11 years before I came to DOE. And I  
5 worked in banking before that. And I've got a profound  
6 -- so, I've been in a position where, you know, I've  
7 been talking to my board of directors trying to get  
8 them to unloose money to do stuff and I know that's  
9 hard to do.

10           It's hard to over emphasize the -- first of  
11 all, the vision and the courage it takes to go first,  
12 to be that serial number one. To take something you've  
13 understood in the lab and be that first pioneer, that  
14 first company to go out and apply that in real life, to  
15 create a new business model. So, to go first is  
16 difficult. But in order to move this forward, in order  
17 to move this technology forward, it's going to be  
18 critically important that we get these demonstrations  
19 up and running, that we get them off the ground, that  
20 we demonstrate to the public that these projects are  
21 not academic exercises, that they're real, and that we  
22 can make them work.

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1           And by doing those first projects, we're  
2 going to get smarter. We're going to get better.  
3 We're going to push costs down. And we're going to  
4 demonstrate that there is a wider application for these  
5 technologies.

6           Now clearly, we need to get the costs down.  
7 And NETL is working very hard on second generation  
8 technologies, and I'll talk about that in a second.  
9 But, going first now, getting those demonstrations on  
10 the ground, getting them up and running, operating  
11 them, letting the regulators see them operating,  
12 getting a track record of monitoring and verification,  
13 so we can go back to the -- to our partners here in the  
14 federal government, the EPA and other agencies, so we  
15 can go to state regulators throughout the United States  
16 and say, you know, "Here's something that will give you  
17 some confidence to allow to permit these projects, push  
18 them into the rate base, because we're demonstrating  
19 that they're viable and they're possible." So, that's  
20 really important. We're learning by doing here.

21           But at the same time, we are working on those  
22 second generation technologies. So, you know, we do

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1 have some very specific goals going forward, projects  
2 that we're working on that's going to reduce the cost  
3 because, you know, we do have to get the cost per  
4 capita down.

5           So, in looking at those second generation  
6 technologies, we do have some very specific goals. You  
7 know, by 2020 to get current costs, that are somewhere  
8 between 60s and \$70 per ton, to get that \$40 per ton by  
9 2020. And receive a 20 percent reduction in the total  
10 cost of electricity generated from power plants with  
11 CCS. So, that's our kind of medium term goal for 2020.

12           And then for about 2030, further reducing  
13 that cost down to \$10 per ton and achieving a 40  
14 percent reduction in electricity that's generated from  
15 power generation with CCS.

16           Another one of our 2020 goals is to achieve  
17 99 percent monitoring and verification, so again, we  
18 can demonstrate to the communities that we understand  
19 what happens when that CO2 goes in the ground, not only  
20 theoretically in our algorithms and our models, but  
21 we're demonstrating that in the field.

22           One thing that's become very evident to me in

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1 my previous responsibilities as the Deputy Assistant  
2 Secretary for Oil and Gas is, you know, we can talk  
3 about the EPA, we can talk about state regulators, we  
4 can talk about BOEM or BSEE or offshore regulators, but  
5 at the end of the day, when you're looking at how we're  
6 going to develop energy in America and how we're going  
7 to produce it and use it, and how we're going to power  
8 our economy, the license to operate is not going to  
9 come from ultimately from the regulators. The license  
10 to operate is going to be a social license to operate  
11 that comes from the people who live and work in the  
12 communities, that are close to the places where these  
13 industrial activities are being carried on.

14           So, we have to take community concerns  
15 seriously, we have to understand concerns. We have to  
16 bring science to the concerns that communities might  
17 have. And we have to be able to very transparently  
18 demonstrate to communities that we scientifically  
19 mitigate -- we scientifically quantified those concerns  
20 that they might be concerned about and that we can  
21 demonstrate that the regulatory system that's in place  
22 is sufficient to mitigate those risks that we've

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1 scientifically quantified.

2           So, as we look at our CCS projects, as we  
3 look at our regional partnership that are doing  
4 demonstrations, one of our primary goals is going to be  
5 to ensure that we're backing into the science that  
6 allows us to go back to the regulators and say, "We  
7 understand what happens when we put this stuff in the  
8 ground. We have data and insights and scientific rigor  
9 that goes behind those investigations." And that we  
10 can give them the tools that they need to then go back  
11 to their constituencies, their communities, and say,  
12 "This is a project we want to permit here in this  
13 district. It's going to create opportunities; it's  
14 going to create jobs. And we had demonstrated and  
15 validated that this is a process that's safe."

16           And I can guarantee you, we've -- you know, I  
17 spent a lot of time on shale gas here recently and I  
18 spent some time on the -- some of the fun, technical  
19 challenges of how fractures propagate and how you best  
20 manage that production. But we spend an awful lot of  
21 time working with communities and, very candidly,  
22 helping -- in some cases, helping industry groups back

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1 themselves out of some holes that they've dug  
2 themselves into.

3           It's hard to make money in an industrial  
4 operation if you've -- if you're in a situation where  
5 there has been animosity that's generated toward your  
6 industry. So we worked very closely with companies  
7 across the spectrum to make sure that we're all moving  
8 forward in lock step.

9           The last thing I'll mention is that there are  
10 a lot of things that we can do here in Washington D.C.

11           and for us to operate more effectively. One  
12 of our challenges is that we've got lots of federal  
13 agencies that do lots of stuff here. We are in our own  
14 individual silos.

15           If I look at the work I've been doing for the  
16 last few years, I've got counterparts at EPA, I've got  
17 counterparts at USGS, and we literally, if you look at  
18 the org chart, we meet at the president, because we  
19 serve different secretaries. And if you don't actively  
20 specifically do something to break down those silos,  
21 they will never be broken down.

22           And you could have an ad hoc conversation

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1 that's based on personalities, you can have subject  
2 matter experts kind of reaching across the field  
3 because some of them have worked in different agencies  
4 and they know each other. But until you  
5 institutionalize that, you're not going to make those  
6 processes better.

7           So, one thing we've done on the oil and gas  
8 side is we've created a single steering team, which I  
9 chaired over the last year, that's taken the research  
10 and development program at EPA, at DOE, and USGS, and  
11 put them under a single framework, under a single  
12 steering team that I was the chair of for the last  
13 year. And it rotates among the agencies so that  
14 chairmanship is now pushed on to the -- to DOI. And I  
15 think that's really helped us have a single, more  
16 sustainable, more maintainable, more transparent  
17 research and development function.

18           So, as I come into this role and I kind of  
19 look at the way that we interact with EPA, I think  
20 there's some real improvements that we can make there.  
21 We're pushing towards a common goal of building  
22 economic prosperity, building jobs, importantly,

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1 reducing greenhouse gas emissions, protecting the  
2 environment, but also building our economy in a way  
3 that gains the confidence of the people who live in the  
4 communities.

5           So, we've got this common goal, which means  
6 that we're going to have to work together, between the  
7 Department of Energy and the Environmental Protection  
8 Agency. We have to ensure that we have a good  
9 understanding of the impacts that rules will have on  
10 companies who are making investments. And we also have  
11 to have a good understanding of the things that our  
12 technology can deliver, such that we're all pushing  
13 together towards one outcome.

14           And that's something that I've personally  
15 committed to trying to achieve for the next period of  
16 time, should I be formally nominated to this position.  
17 But I can say that there's a real appetite for doing  
18 that, for trying to do that well and that's something  
19 that we're going to try to push forward on and improve  
20 and achieve.

21           So, with that again, I just want to say thank  
22 you to this group. Again, I've got a profound

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1 understanding for the value that federal advisory  
2 committees bring. It's very easy to get hypnotized  
3 here within the Beltway, all of us talking to one  
4 another, so these engagements are always a welcome  
5 infusion of subject matter expertise from outside of  
6 Washington D.C. and outside of government, to help us -  
7 - help guide us and help us think about what we need to  
8 be doing next.

9           So, I'm very interested in ideas that you  
10 might have for your future studies and having --  
11 opening a two way dialogue about how can we better  
12 ensure that this federal advisory committee has a real  
13 impact on the work that we do.

14           So, with that I just want to say thank you  
15 and I'd be happy to take a few minutes of questions if  
16 there are any questions.

17           MS. GELLICI: Thank you, Chris.

18           Do we have any questions?

19           MR. NARULA: My name is Ram Narula, an  
20 independent consultant. You talked about reducing the  
21 cost of CO2 capture, the goal of what, \$10 a ton by  
22 2030 or thereabouts. Now, the best ton of CO2

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1 sequester is the one which is not generated in the  
2 first place, which is improving the efficiency. And  
3 our Department, DOE, invested over \$50 million in  
4 developing the materials for advanced critical  
5 technology.

6           So, my question is, what are the plans to go  
7 to the next phase which will lead to actually component  
8 testing of those materials and then to an ultimate demo  
9 plant.

10           MR. SMITH: Well, thanks for that question.  
11 So, our advanced work in super critical processes in  
12 turbine efficiencies and materials, that remains an  
13 important part of what we do. You know, so here's one  
14 of our challenges throughout everything we do. This is  
15 a -- what I can only characterize as a ferociously  
16 difficult budget environment. We're in a situation  
17 where we're going to have to do more with less and  
18 we're going to have to find ways to ensure that we're  
19 partnering with industry in a way that we attract the  
20 right type of cost share and we're able to move these  
21 technologies forward.

22           So, throughout every budgetary process, and

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1 our budget just came out not too long ago, through  
2 every budgetary process, there's a certain amount of  
3 funds that the Department has that there's a -- you  
4 know, there's an enthusiastic and vigorous competition  
5 for those funds, like say the assistant secretaries.  
6 And then once we have those allocations we have to make  
7 some hard decisions about where we are investing.

8           But I can assure you that those projects are  
9 of interest. They're certainly on the fundamental  
10 science side. There's work that's going on right now.  
11 And I tell you, one of the things that we would really  
12 appreciate from this group, as you consider what  
13 studies you undertake, is if there's guidance or advice  
14 on how we can better target funds to get the right  
15 types of outcome, you know, we're all ears.

16           But I will say that certainly that the idea  
17 of the most efficient way of capturing CO2 is by not  
18 producing it in the first place, and increasing  
19 efficiency is a philosophy that we carry throughout  
20 DOE. In fact there's, you know, outside of our  
21 program, we've got a big efficiency effort and efforts  
22 to put in place regulatory schemes that don't penalize

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1 greater efficiencies, through decoupling. So, that is  
2 certainly a philosophical point that we understand and  
3 that we support and we'll endeavor to move forward on.

4 MS. GELLICI: Other questions?

5 MR. PALMER: Mr. Secretary, welcome and thank  
6 you for being here. I'm Fred Palmer with Peabody  
7 Energy and I'm next, you don't have to stay. But  
8 you're welcome to stay.

9 You made the comment about working with EPA  
10 and of course there's a lot of concern in the utility  
11 industry and in the middle of the country, where I live  
12 in St. Louis, Missouri, which Missouri is 60 percent  
13 coal-fired, Indiana 90 plus percent, Kentucky 90 plus  
14 percent, et cetera.

15 With the new source performance standards on  
16 greenhouse gas emissions, and to the efficiency point,  
17 there is a very strong school of thought that says the  
18 coal fleet efficiency today, at 31 percent, is stuck in  
19 the mud because of EPA and we can't go forward with  
20 increasing the efficiency of the existing fleet because  
21 of the issues surrounding NSPS and the difficulty that  
22 utilities have in upgrading the existing fleet.

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1 I just wondered if you'd had any discussions  
2 of that yet, in your new role, and whether that's  
3 something that you think would be worthwhile exploring  
4 with EPA as we go forward.

5 MR. SMITH: Yeah. So, first of all, thanks  
6 for the question. So, certainly that would be I think  
7 at the very center of the types of things that we'd be  
8 discussing. Again, we want to ensure that the work  
9 that we're doing, not only the technology, but also on  
10 the regulatory side, has a desired effect of  
11 incentivizing technology development, adaptation of  
12 technology and importantly pushing down greenhouse gas  
13 emissions at the same time that we build our economy.

14 So, those are -- we certainly don't see those  
15 as conflicting mandates. In fact, we need to ensure  
16 that we're moving forward in a way that they are  
17 coordinated.

18 But when you talk about, you know, what type  
19 of coordination do we need between EPA and DOE, I think  
20 within the Department we've got a -- first of all,  
21 we've got a great understanding of the technologies  
22 that are emerging, what technology can develop and an

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1 understanding of the impact that particular regulations  
2 might have on the way that the capital is allocated.

3           And so when we talk about how DOE interacts  
4 with the other agencies, you know, right now we've got  
5 something of an ad hoc relationship I think that we can  
6 formalize. And I think at the department level, I  
7 think we need to have a more definite answer to those  
8 types of questions.

9           And when you ask me and you ask EPA you  
10 should get the same answer. I don't think you get that  
11 right now, simply because it's just where we are. You  
12 know, one insight I'll give you is -- or observation, I  
13 don't know if it's insightful. But, you know, when I  
14 came into my last job, as soon as -- I didn't even have  
15 the seat warmed up before there was a line of people  
16 outside my office door coming to see me from all the  
17 oil companies.

18           And so I say, "Hey, great. You know, people  
19 want to come talk to me. Great." And they come in and  
20 before they even get to hello, basically their entire  
21 line of argument is complaints about EPA. They're here  
22 to see me because I can help them with EPA. Right? So

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1 I mean, no one wants to talk to me, they just want to  
2 talk to me about what can I do about EPA.

3 Now, on the other side of the street, at EPA,  
4 you've got NKOs and other entities that go to EPA to  
5 complain about industry and about DOE.

6 And so you have this potential to create  
7 these two sock puppets between DOE and EPA that are  
8 kind of being moved by these outside forces that aren't  
9 pointed in the same direction. And it's a doubt way to  
10 do business.

11 So, you know, one specific goal that I would  
12 have is that -- first of all, I think we did a good job  
13 of stopping that on the business that we were working  
14 on before, because we got EPA and DOE pointed in the  
15 same direction, which I think impacted both of our  
16 organizations. It made us think a little bit  
17 differently about how we do things. And it also, I  
18 think, compelled EPA to think a little bit differently.

19 So, it's our goal -- and this is hard, by the  
20 way, you know, so we're not going to get this done next  
21 week, but certainly an aspirational goal, to create an  
22 environment in which you've got one federal government

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1 pushing in one direction with full transparent  
2 understanding of the risks and opportunities of that  
3 strategy and it becomes more coordinated.

4 So that's the big kind of change Washington  
5 strategy. And, you know, ask me in a year and half how  
6 far we've gotten. I hope we do make some progress. I  
7 do have a lot of energy for that.

8 MR. EAVES: One more question?

9 MR. FRIEDMAN: Hi there. Julio Friedman,  
10 Lawrence Livermore National Laboratory. I was hoping  
11 you'd just take a minute and talk about both your  
12 office or DOE's efforts as a whole with respect to  
13 U.S./China engagement, both in the context of  
14 collaboration around research, but also support of  
15 business to business opportunities.

16 MR. SMITH: Yeah, so thanks for that  
17 question, Julio.

18 So, I probably should be asking you about  
19 that; right? Because I think you probably know more  
20 about that than anyone in this room. But I can give a  
21 little bit of insight in some things that we're doing.  
22 And you know, when that question from Peabody actually

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1 made me think very directly of China because I was just  
2 in Xinjiang Province out in the western part of China,  
3 meeting with the -- China's -- sorry, the provincial  
4 governor, Governor Nuri (ph) and the party secretary,  
5 Party Secretary Zhang.

6 I was accompanying Ambassador Locke on his  
7 very first visit to that province in over 20 years. So,  
8 20 years since a senior U.S. official has made an  
9 official visit to Xinjiang Province, out in Western  
10 China. And as some of you know, it's where the weaker  
11 minority population lives and there's been various  
12 reasons why there's been strained relations with the  
13 United States in that part of the country.

14 So, without delving too much into the  
15 politics of some of that history, I can say that we  
16 certainly saw, that part of the country, 20 years of  
17 pent up demand in that visit and lots of interest in  
18 opportunities for American companies to come and make  
19 investments. Peabody, very specifically, had an issue  
20 out there that was raised by the ambassador.

21 So, there is -- I think there are big  
22 opportunities in China for us to achieve. I'll make a

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1 couple comments. First, we -- you know, I tried to  
2 emphasize the fact that the demonstrations here are  
3 important for us. I mean, we have to be building  
4 things in order to move forward, we can't just do them  
5 in the lab.

6           And we not only have to build them here, we  
7 have to make sure they build them over there. And, you  
8 know, for many of you who spend a lot of time in China,  
9 this last trip was probably the worst I've seen in  
10 terms of, you know, looking out your window and not  
11 being able to see across the street. I mean, it was  
12 dramatic; it was really dramatic this time. And maybe  
13 I've just been there -- I've been lucky when I've been  
14 there before.

15           But certainly other parts of the world are  
16 becoming sufficiently prosperous that they've got the  
17 luxury of worrying about environmental issues, which we  
18 think is unambiguously good. Because we can work on  
19 the carbon problem here, we can reduce CO2 emissions  
20 here in the United States, but if we're not doing  
21 things in China and India, if they are not doing  
22 things, if they're not building demonstrations, if

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1 they're not actually applying the technologies there  
2 also, we're not going to accomplish anything. We're  
3 not going to keep our mission.

4           So, working together with China is critically  
5 important. There has been a longstanding relationship  
6 between the Department of Energy and NEA in China, so  
7 we think we do have this long relationship, we've got  
8 good ties, I think we've got good communication. And  
9 our goal is really to ensure that we're creating --  
10 first that -- I guess two goals.

11           First, we think that our and the Chinese  
12 interests are aligned in increasing clean energy  
13 production and reducing CO2 emissions from carbon-fired  
14 -- coal-fired power plants in China. So, we are  
15 unambiguously pointed in the same direction there. A  
16 success for China is a success for America, including  
17 terms of reducing greenhouse gas emissions.

18           We're also very explicitly interested in  
19 creating opportunities for American companies in China.  
20 It was actually fun to watch Ambassador Locke manage  
21 that engagement. The current ambassador to China was  
22 the former commerce secretary and is still very much in

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1 commerce secretary mode when he's talking about  
2 commercial issues. So, we understand the issues that  
3 companies have and we have a very clear and unambiguous  
4 mission to create opportunities for American companies  
5 in China.

6           So it's an area of focus for us. You know,  
7 and we certainly appreciate the guidance and advice that  
8 we get from this group and from Julio in particular.  
9 And we see that this is a reason that we can capture  
10 some wins.

11           MR. EAVES: Do we have time for maybe one  
12 more?

13           MS. GELLICI: One more. That's it.

14           MR. DALTON: I'm glad I have an opportunity  
15 to address you. I'm Stu Dalton with the Electric Power  
16 Research Institute and I want to commend some of the  
17 past efforts of the fossil energy on things like HAPS,  
18 water, efficiency, et cetera. There's been a good  
19 partnership, I think, with industry.

20           And I point out that one of those areas where  
21 I think we need to figure out how to continue the  
22 partnership is water. I know there's a lot of issues

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1 and discussion within DOE. There's a Energy Water  
2 Nexus Task Force, et cetera. And I know there have  
3 been some limitations, not just budget, but  
4 restrictions on the last few years of joint work with  
5 industry.

6 But one of the successes in the past has been  
7 with air. And what our members are now telling us is  
8 water is the new air. Water is where it goes. One law  
9 Congress can't pass is the law of unintended  
10 consequences. We've had a number of things that we've  
11 taken out of the air now and we're dealing with in  
12 water. And we did a lot of work together with industry  
13 on mercury, for instance. And now we're getting  
14 concerns about arsenic, selenium, and other things and  
15 we're seeing the new EPA proposals.

16 So, all those issues which you talked about  
17 before on how we have to work on this with the EPA and  
18 go across the silos, I think, you know, some of the  
19 water issues go across to nuclear, go across to gas.  
20 And I'm just hoping that you'll be able to make the  
21 kind of progress that we did in the past on that area.  
22 Thank you.

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1 MR. SMITH: Well, thanks for that comment.

2 And, you know, water's the new air, I'm going to work  
3 that into my talking points. That's a good way of  
4 saying that.

5 But yeah, I mean, I won't say too much except  
6 to concur with everything that you just said. I talked  
7 a bit about breaking down silos between EPA and USGS  
8 and DOE and that's kind of -- that kind of feels like  
9 world peace because we're still breaking down silos  
10 between EERE and also fossil energy and nuclear,  
11 because many of the water issues that we have span the  
12 different organizations. So you're obviously aware of  
13 the intra-agency, intra-DOE task force that we're  
14 trying to piece together some of those efforts.

15 Because, you know, the work is going to  
16 remain -- I mean, we're not going to create an office  
17 of water, although I think there was legislation at one  
18 point that was compelling DOE to do something like  
19 that. But we do need to make sure that what we're  
20 doing within fossil energy, from water issues from  
21 coal-fired power plants to issues with hydraulic  
22 fracturing, are coordinated with the things we're doing

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1 on the nuclear side, with biofuel side, with solar  
2 side. And there's certainly some synergies we can  
3 accomplish. So, your point's well taken.

4 MS. GELLICI: Thank you, Assistant Secretary.

5 MR. EAVES: Thank you very much, Chris. That  
6 was very insightful. We certainly do look forward to  
7 working with you on ideas on new studies. And so we  
8 will be coming to you shortly with some potential new  
9 ideas.

10 Next, I'd like to introduce Fred Palmer, who  
11 actually needs no introduction. He is our chair of our  
12 policy committee. Fred and his team have worked very  
13 hard in looking back over the last nine studies and  
14 developing a vision for the 21st century and I think  
15 you'll like what he's got to say.

16 So, Fred, welcome.

17 MR. PALMER: Thank you very much. It's a  
18 continuing source of honor for me to be in front of you  
19 and to work closely in the -- with the chairman and the  
20 management team, Janet, welcome, the National Coal  
21 Council to help produce these studies and to serve in  
22 the role that I serve at Peabody.

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1 I want to first thank Secretary Smith for  
2 being here. I have no doubt the nomination process  
3 will go smoothly for him. And, welcome. It's really  
4 important that we have somebody as steeped in the  
5 hydrocarbon arena, with his experience, serving in this  
6 role.

7 Secretary Moniz, congratulations. We have  
8 worked -- we worked with Professor Moniz for many  
9 years, at MIT, in the carbon capture and sequestration  
10 program that they undertook. Peabody was a contributor  
11 to that. And I've spent a couple of really informative  
12 sessions up in Massachusetts listening to his wisdom  
13 and the very robust program that they had going on  
14 there, which has advanced the technology goals that we  
15 all aspire to.

16 I want to personally thank Secretary Smith  
17 for being in Xinjiang Province, Urumqi, which is the  
18 capital and I have been there a couple of times. I've  
19 met with the party secretary who is a really impressive  
20 man and the management team there, the governor and the  
21 vice governor. And we did have a delegation there. We  
22 have publicly announced a joint venture we're working

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1 on with Xinjiang Province, with a state-owned  
2 enterprise that they created, to put in a surface mine  
3 best practices by Peabody in Western China.

4 I'm going to China tomorrow for the World  
5 Coal Association meeting next week. And it's -- at  
6 this stage of my career, it's really been a pleasure  
7 for me to get this exposure in the international coal  
8 arena. I say to people that, having been in the coal  
9 industry for the United States for a while, that coal  
10 is coal and that coal people are coal people. The  
11 cultures are different, the language is different, the  
12 mannerisms may be different, the way they do business,  
13 not a lot different, but they're coal people. And so,  
14 coal is coal, and that's been my life and of course  
15 that is Peabody, under Greg Boyce's leadership.

16 I also want to comment and thank the Obama  
17 Administration and the president for the very strong  
18 ties that do exist between the United States and China.  
19 I said last week at an Orlando event that President  
20 Obama I think understands the importance of the China  
21 relationships better than any president that I've had  
22 experience with. And the relationship with the

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1 People's Republic of China in the energy arena could  
2 not be stronger.

3           The DOE/NEA collaboration, the joint projects  
4 that are under way, the clean coal centers here and  
5 there that both have set up is really important and I  
6 think bodes well for the development of the world  
7 economy and indeed the continued advancement of  
8 progress, both in the United States and in China, on  
9 our shared economic and environmental goals.

10           So, let me take you quickly through this deck  
11 that we have that takes us back through what we've done  
12 in the -- since 2000. And here's a brief reminder of  
13 our charter. I'm a lawyer. We have a client. Our  
14 client is DOE and Secretary Moniz, and we act that way.  
15 We try to be responsive, at the same time being  
16 educational. Do we have a point of view? We might.  
17 But we always do it in a professional way and in a  
18 shared value way. And there will be ongoing  
19 discussions with Secretary Smith in terms of areas of  
20 inquiry that they'd like to see examined and some ideas  
21 that we have.

22           If you go back to 2000, here are the full

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1 panoply of studies that we have performed. There are  
2 nine of these studies. And the very first study that's  
3 listed there actually was chaired by Steve Lear, John  
4 Eaves predecessor as CEO and chair of Arch, and looked  
5 at the increasing electricity availability from coal-  
6 fired generation in the near term.

7           And that, as my question indicated, is an  
8 area of inquiry today. How do we maximize the value of  
9 the existing coal fleet in the United States that is at  
10 31 percent efficiency, when super critical, ultra super  
11 critical coal plants going in are in the low 40 percent  
12 efficiency range up to 46 percent in Japan?

13           In the middle of these studies you see the  
14 2006 study, "Coal America's Energy Future." And that  
15 was chaired by the man I report to, Peabody's chair and  
16 CEO, Greg Boyce, setting forth a vision that we think  
17 is still there for coal in the 21st century.

18           The 2009 study, "Meeting U.S. Energy,  
19 Employment and CO2 Emission Goals with 21st Century  
20 Technologies," took the President's -- identifying with  
21 an 80 percent reduction in greenhouse gas emissions by  
22 2050 and showed how that can be accomplished through

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1 developing the full development of the nation's coal  
2 fleet, with not just carbon capture utilization and  
3 storage, enhanced oil recovery, as Secretary Smith  
4 discussed this morning, but also deep geologic storage.

5           FutureGen lives. I'm on that board, it's  
6 still going forward. And it is something that we need  
7 to do. If we're going to achieve that goal, that 80  
8 percent reduction goal, you have to have FutureGen and  
9 you have to have many FutureGens and that's been  
10 recognized by all the leadership of the OECD West and  
11 has been recognized by the People's Republic of China,  
12 the GreenGen Project near Tianjin that Peabody's a part  
13 of. These things have to happen. If they don't  
14 happen, we won't achieve the goals and we will still be  
15 using coal. So, the urgency for sure is there.

16           And then the most recent study that we did  
17 last year, that Dick Bajura chaired and the excellent  
18 job that he did, the enhanced oil recovery study,  
19 "Harnessing Coals Carbon Content to Advance the  
20 Economy, Environment and Energy Security." So, this is  
21 a vision, a true vision, in these studies, for 21st  
22 century coal that are relevant. The 2011 study, done

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1 by Chairman Lear, is as relevant today as it was then.  
2 And of course, last year's study is relevant. And we  
3 the EOR activity going on right now, which we applaud  
4 and find it very, very reassuring of Secretary Smith's  
5 embracing of those developments this morning.

6 Our vision we strongly believe is good for  
7 the economy, good for the environment and good for  
8 people. The continued and expanded utilization of  
9 America's vast coal endowment is overwhelmingly in the  
10 public interest. Coal-based energy is a foundation of  
11 social development that allows more people to live  
12 better and live longer. Coal conversion to  
13 electricity, liquid fuels, substitute natural gas and  
14 chemicals will enable the United States and the world  
15 to meet the ever-rising tide of energy demand.

16 Is there anywhere in the world that's done?  
17 Yeah, right now, it's called China. Clean coal  
18 technology, including higher efficiency generation,  
19 carbon capture utilization and storage are the pathways  
20 to sustainable energy, economic growth and climate  
21 change policies. And affordable and reliable  
22 electricity from coal enables the expansion of electro-

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1 technologies, beneficial electrification, what Mark  
2 Mills calls ecowatts, which are the basis of modern  
3 society.

4           So, here's the -- this is the cover from the  
5 2006 study. And many of those same themes are set  
6 forth there and I won't reiterate them, that I just  
7 discussed from the previous slide. But this is an  
8 important point at the bottom.

9           "Affordable and reliable electricity is the  
10 first value." Air, food, water, electricity,  
11 necessities of modern life. I believe I saw a quote  
12 from Secretary Smith in Xinjiang that identified this  
13 and identified this value. And we are -- we subscribe  
14 to that.

15           All of us in the coal industry, the coal  
16 chain industries, in the regulatory arena, in academia,  
17 the people that are interested in coal share that  
18 value. And that is the one we have to keep in front of  
19 us.

20           And I mean it when I say, in Missouri the  
21 concern over what we talked about earlier with EPA,  
22 there's a foot note in the proposed draft order, new

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1 source performance standards, that says to meet the  
2 standards, coal-fired electricity goes up 82 percent,  
3 the cost of it, 82 percent. And coal is the dominant  
4 electricity fuel in the United States, so what does  
5 society look like with an 82 percent increase in  
6 electricity costs? Obviously, we can't -- that will  
7 not happen, can't happen, but these are the kind of  
8 educational points that we need to continue to make.

9           In the scope of these studies, over the last  
10 12 years, you will find the following. The goal, of  
11 course, near zero emissions. As we put it, continual  
12 emission improvements leading to near zero emissions,  
13 starting with efficiency improvements at the existing  
14 plants, the 2001 study. Building new super critical  
15 and ultra super critical plants. Demonstrating and  
16 deploying IGCC and carbon capture utilization and  
17 storage and ultimately geologic deep storage. Advancing  
18 carbon capture utilization and storage and BTU  
19 conversion, coal to liquids with enhanced oil recovery,  
20 for example. Retrofitting the existing coal-based  
21 generation with carbon capture and storage up to 90  
22 percent lower CO2 emissions, with CO2 enhanced oil

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1 recovery.

2           But on that other -- on the point of  
3 retrofitting existing coal-based generation, one of the  
4 best documents on the importance of that is from DOE.  
5 And it was put out the day the FutureGen 2.0 was  
6 announced. And it identified oxy-combustion as the  
7 path forward for FutureGen. And it identified the  
8 importance of oxy-combustion development on an  
9 affordable and reliable basis to retrofit the existing  
10 fleet of power plants in the United States.

11           I used portions of that presentation in my  
12 presentations and I use them here, and I use them  
13 abroad, and I use them in China. And I've given  
14 several of these in China, I'm giving another one in  
15 September and it is an extremely important development  
16 and FutureGen needs to go forward.

17           So, here's the progress we've made over the  
18 years with coal-based generations, GDP per capita  
19 growth and the strong correlation between the two. And  
20 at the same time, the huge reduction in criteria  
21 mission pollutants, NOx, SOx and there's a mercury coal  
22 benefit identified with scrubbers EPA has accepted

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1 around 90 percent.

2 This same pattern can be followed, going  
3 forward, on CO2 emissions, if we deploy the technology  
4 correctly. If we do not -- if we are not able to do  
5 that as a society, coal will still be used, but the CO2  
6 will not follow that emission path downward.

7 Coal's versatility is its greatest value. We  
8 say carbon is a product, not a problem. Enhanced oil  
9 recovery, construction, food, electricity, industrial  
10 gas, pipeline quality, SNG, steam for ethanol, diesel,  
11 jet fuel, hydrogen, chemicals and fertilizers, all of  
12 those, except ethanol, are being done today in the  
13 People's Republic of China and China has embarked on a  
14 CO2 capture and sequestration demo project, and that's  
15 Shenua in Inner Mongolia, and of course GreenGen, which  
16 is the IGCC Project, with enhanced oil recovery in  
17 Bohai Bay.

18 Here is -- this slide is from the 2006 study,  
19 identifying our aspirational goal of 2.4 billion tons  
20 of coal production and consumption in the United  
21 States, for electricity and all the things we talked  
22 about before. Will this happen? Can this happen?

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1 Should this happen? In a carbon constrained world,  
2 whether through government or the fact that there's not  
3 enough carbon in the world to go around, we think this  
4 happens. Because coal, with carbon capture and  
5 storage, if the rules are applied equally to natural  
6 gas and coal, in terms of the emissions footprint, is  
7 the low cost, low carbon, hydrocarbon and therefore the  
8 low cost, low carbon source of energy for not just the  
9 United States but also the world.

10           And we forget in the United States -- we talk  
11 about the developing world, we forget we are a  
12 developing country. So, John F. Kennedy once is quoted  
13 as saying that we came over on different ships, but  
14 we're all in the same boat, because we are a nation of  
15 immigrants and that is absolutely true and that will  
16 continue to be true.

17           I grew in the American Southwest, that was  
18 part of Mexico. There are parts of Arizona that are  
19 still a part of Mexico. Tucson, where I went to  
20 school, for example. But we've got 80 million people  
21 coming, population-wise by 2035, \$12 trillion growth in  
22 GDP, a huge increase in the consumption of electricity

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1 and also a huge increase in the number of vehicles on  
2 the road. So, the U.S. is a developing country.

3           And there's our coal resource. From the  
4 lignite fields in the southeast to the Northern Plains  
5 and primarily North Dakota, to the Powder River Basin  
6 where both Peabody and Arch are major producers. The  
7 other western reserves, including the southwest, into  
8 my home state of Arizona, the Navajo Hopi Reservation  
9 that you see there right above Four Corners, the  
10 Illinois Basin, Northern and Central App and yes, the  
11 central interior, where they actually mined coal in  
12 Missouri for steam generation not too long ago, and I  
13 believe that will happen again in the world we see  
14 coming.

15           And we forget that the coal fleet that was --  
16 that we enjoy today came out of really strong  
17 bipartisan support in the late '70s and early '80s, and  
18 primarily the late '70s, and it was President Jimmy  
19 Carter that called for Project Energy independent  
20 because of the oil shocks in the '70s. Jim Schlesinger  
21 was the first Secretary of Energy. Dr. Schlesinger was  
22 on the Peabody board and I know him well.

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1           We were -- in the late 1970s, we were 17  
2 percent of our electricity generation was from imported  
3 oil and it was going up. And that is why we turned to  
4 coal generation, coal and nuclear at the time. And you  
5 see the quote from President Carter at the bottom, so  
6 coal has flourished in a bipartisan way in the United  
7 States, since we first started using it in a robust way  
8 and that's why I like to say our political party is  
9 coal. And it is.

10           And the reason we do that is because of the  
11 recognition that electricity enables people to live  
12 longer and better. And this is a slide showing the  
13 Human Development Index from the United Nation. Every  
14 tenfold increase in per capita electricity use drives a  
15 ten year increase in longevity and that theme is a  
16 constant in our studies.

17           Here is EIA's projection of coal going  
18 forward to 2040. And while they don't have it at 2.4  
19 billion tons, they have it as a remaining as still the  
20 dominate electricity fuel in the United States, coal.  
21 And that is going to stay. And given that, Washington  
22 D.C.

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1           needs to pay more attention to coal, with all  
2 humility, Mr. Secretary. And this town, having been  
3 around it for a while, likes to talk about everything  
4 but coal, in a robust way. And yet coal is what has  
5 powered the economy and will continue to power the  
6 economy.

7           This is another way of saying the same thing.  
8 U.S. coal produces more electricity than its share of  
9 capacity and will continue to do that, even with the  
10 retirement, in the intermediate term, of some of these  
11 smaller, older plants. And why is that? Because coal  
12 is lower electricity rates and you can -- and from this  
13 slide, you see the coal dominate states are -- the coal  
14 using states have the lowest electricity rates.

15           And we like to say, and we do say, and we  
16 believe this, that at the end of the day, this isn't  
17 about coal; it's about people. And it's about people,  
18 in terms of how they live their lives, how they get one  
19 of life's basic necessities, electricity and energy,  
20 what it costs them, what's the impact on it if we get  
21 this wrong and we make it scarce and expensive, as  
22 opposed to reliable, affordable and abundant. That's

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1 coal and that's why these states are where they are,  
2 versus the high cost states, like California, for  
3 example, that has an electricity standard for coal  
4 emissions that have been identified by EPA as where EPA  
5 wants the country to go.

6           The answer we get as a country is where  
7 California is, if we do that. And the people in  
8 Missouri, Wisconsin and the lower cost states are not  
9 going to be happy.

10           Why coal? Because affordable electricity is  
11 good and more is better. Our studies demonstrate the  
12 positive impacts from beneficial electrification,  
13 again, ecowatts and the widespread deployment of  
14 electro-technologies.

15           China's new president, Xi Jinping, gave a  
16 speech in Hainan Beach about four weeks ago and talked  
17 about the need to develop a common source of energy for  
18 the world, what he called "inexhaustible power." Well,  
19 we have a source of inexhaustible power; it's called  
20 electricity. And coal is electricity. And we have  
21 trillions of tons of resources, as opposed to reserves,  
22 just like the shale gas people talk or the oil people

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1 talk, that is available as technology is available and  
2 prices go up to continue to supply electricity to the  
3 United States and indeed, to a growing world. And not  
4 just China, of course, but India.

5           Retrofit programs would increase efficiency,  
6 decrease emissions. These are estimates, the concepts  
7 taken from the 2001 study as we discussed, updated to  
8 today. You see AEP estimates that upgrades on their  
9 fleet would yield reductions of more than 3.5 billion  
10 tons of CO2 per year in its existing coal generation  
11 fleet.

12           The socio-economic benefits of advanced coal  
13 facilities have been documented in a number of these  
14 studies, in terms of jobs created, dare I say green  
15 jobs? I think so. 6.9 million job years, \$1.1  
16 trillion in increased economic activity, labor income  
17 to hard working men and women with well-above average  
18 pay rates, in the \$60 to \$70,000 per year range of \$368  
19 billion, the number of jobs, output, et cetera.

20           We haven't done a coal study on exports, but  
21 it's been implicit in here, and there is a controversy  
22 of sorts surrounding coal exports on the West Coast.

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1 This concept has been introduced with the policymakers  
2 on the West Coast and it is President Barak Obama, in  
3 his State of the Union 2010 where he announced a  
4 President's National Export Initiative.

5 We need to export more of our goods, because  
6 the more products we make and sell to other countries,  
7 the more jobs we support right here in America. We  
8 will double our exports over the next five years, an  
9 increase that will support 2 million jobs in America.

10 We have to seek new markets aggressively,  
11 just as our competitors are. If America sits on the  
12 sidelines while other nations sign trade deals, we will  
13 lose the chance to create jobs on our shores. Coal  
14 exports obviously qualifies, and it is the view that  
15 has been expressed in these studies, that coal exports,  
16 to a world that is turning to coal, with coal soon to  
17 become the world's dominant fuel, over oil and over  
18 natural gas, that U.S. coal exports to be deployed in  
19 super critical and ultra super critical power plants,  
20 which are being built in China and India, are  
21 overwhelming in the public interest.

22 Here's a slide on the China driving demand

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1 for seaborne coal. Their exports this year are  
2 projected - - or their imports this year are projected  
3 to be in the 300 million ton range, rising up to 400  
4 million tons by 2017. So obviously, that is a source  
5 of demand for more coal exports from the United States  
6 and more economic activity in the United States.

7 India is likewise a rapidly growing coal  
8 importer. The Indian coal imports are projected to  
9 reach 200 to 220 million tons per year by 2016.

10 Thank you, Mr. Secretary.

11 Coal conversion to chemicals. Again, this is  
12 an outline of some of the matters that we addressed in  
13 these several studies, that we have put on the table  
14 and the job creation associated with these studies is  
15 outlined right here.

16 CO2 for enhanced oil recovery will be  
17 increasingly economical, as Dick's study showed and  
18 these figures are from that, from EIA and from their  
19 annual energy outlook. And the U.S. oil is there, more  
20 CO2 is needed.

21 I like to say that coal's competitive  
22 advantage is its carbon content, because in a CO2

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1 constrained world, we have a home for it, and that is  
2 more production from our stranded oil fields.

3           The demand for CO<sub>2</sub>, again from Dick's study,  
4 is right here. The CO<sub>2</sub>-EOR can accommodate a major  
5 portion of CO<sub>2</sub> captured from coal-fired power plants  
6 for the next 30 to 40 years, from the president of ARI,  
7 Vello Kuuskraa, really the -- maybe the most important  
8 individual in the EOR space. The magnitude of economic  
9 impact on jobs from CO<sub>2</sub>-EOR again, this is from the  
10 2012 study.

11           Will crude oil prices continue to rise? EIA  
12 says they will. I think it is a given that they will,  
13 because there is not enough around for the people that  
14 are coming and the people that are going to be used.  
15 So, the market for enhanced oil recovery in the United  
16 States will be robust and the need for CO<sub>2</sub> from coal  
17 utilization equally will be robust.

18           Is tight oil a game changer in this space?  
19 This is John Hofmeister, former CEO Shell Oil, on U.S.  
20 shale output, just last year. "It's a  
21 trickle when we need a river of new supply." So, the  
22 demand for EOR and coal -- CO<sub>2</sub> from EOR will stay.

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1           And finally natural gas, are we in a market  
2 now where natural gas is going to be four dollars  
3 forever? I don't think so. The goal of the producers,  
4 in promoting the LNG export facilities certainly is to  
5 get a higher price for it, and to have this LNG be  
6 priced off oil and therefore, U.S. natural gas output  
7 priced off oil. We are not opponents of shale gas in  
8 any way, shape, or form. I think it's a tremendous  
9 development that we have seen and will lead to load  
10 factor power. It's really, in many ways, a coal world  
11 because of the increased activity from the chemical  
12 plants and the new industries that will surround the  
13 natural gas that is available for those plants.

14           And then finally, the overarching message in  
15 all of these has been advancing clean energy from coal,  
16 low carbon emission coal, China's GreenGen, Australia's  
17 Coal 21 Fund, U.S. FutureGen and down the list. And of  
18 course the U.S. Department of Energy National Carbon  
19 Center is a hugely important player in that space and  
20 we applaud the work that DOE is doing there.

21           And finally, the summary of a decade of  
22 National Coal Council Research highlighting the points

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1 that I have just covered, in terms of the social -- the  
2 importance of coal for social development through coal  
3 energy and the opportunity that is there for us as we  
4 go forward in a growing nature of 425 million people by  
5 2050, the urgency of sustainable coal for American  
6 citizens has never been more apparent. And that, I  
7 believe, was our 2008 study.

8 Thank you very much.

9 MS. GELLICI: Do we have any questions for  
10 Fred? Thank you, Fred.

11 MR. PALMER: One other thing, if I might --  
12 just one of the things we have been discussing, and  
13 Janet is working on this with the coal policy  
14 committee, are the ideas we might have, as Secretary  
15 Smith just indicated, for future studies. So, input  
16 from any and all of you absolutely is welcomed.

17 One thought we have is the -- have had, which  
18 I think has merit, is preserving the existing fleet.  
19 So, the plant closures are going to go forward because  
20 some of these are very old plants, very small plants;  
21 the amount of money having to be invested in those  
22 plants is problematic for many of the utilities. But

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1 there is a cadre of coal plants that's there that will  
2 take us back to where we were two or three years ago,  
3 as natural gas prices come up and coal regains market  
4 share from those plants.

5 But it's only going to be there if the plants  
6 are there. So, the question is, how do we get that  
7 concept in play right now, with this administration.  
8 And can the National Coal Council serve a role in  
9 educating Secretary Moniz and his team and Secretary  
10 Smith doing that kind of a study. Okay?

11 I want to thank you all very much. And thank  
12 you for the work that you do.

13 MS. GELLICI: Thank you, Fred.

14 MR. EAVES: Thank you, Fred. Let's give both  
15 speakers a hand. Good job.

16 MR. EAVES: You know, if we could, let's take  
17 about a ten minute break. We'll reconvene about 10:25  
18 and get started on the second session. Thank you.

19 (Whereupon, a short recess was taken.)

20 MR. LONG: Okay, good morning.

21 ALL: Good morning.

22 MR. LONG: I'm John Long. I'm the vice-chair

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1 of the Council. And I'd like to ask David Surber,  
2 chairman of the National Coal Council Communications  
3 Committee to come up and introduce our next speaker.

4 MR. SURBER: Mr. Chairman, friends and  
5 colleagues on the National Coal Council, in a speech  
6 made during his presidency, Jimmy Carter observed, "The  
7 fruits of technology are bitter and sweet." So too  
8 with the technology of the internet and sadly, its  
9 vulnerability to threats and attacks from those who  
10 mean us harm.

11 Former Defense Secretary Leon Panetta  
12 suggested that cyber terrorism could be our next Pearl  
13 Harbor. For those of us in this room whose  
14 responsibility it is to keep the lights on, the grid  
15 safe and the digital controls, which make it possible  
16 to mine and ship coal, I make bold to ask that we pay  
17 close attention to our next speaker, Christopher Ling,  
18 executive vice president of the important cybersecurity  
19 firm Booz Allen Hamilton.

20 Mr. Ling works under the direction of Admiral  
21 Mike McConnell, who was head of the National Security  
22 Agency under Presidents George Bush and Bill Clinton.

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1 He brings a sobering message today, which we dismiss at  
2 our peril. It is my prayerful hope that we may take  
3 comfort from the observation, "Fortune favors the  
4 prepared."

5 It is my honor to introduce Christopher Ling.

6 MR. LING: Thank you very much. Thank you  
7 for having me. I must admit that I'm a stand-in. The  
8 original invitation went out to Admiral McConnell  
9 himself. And so it's with trepidation that I actually  
10 come here and try and speak to you about this subject  
11 when someone can do it so more eloquently than I and  
12 has much more experience.

13 Mike and I have actually worked together for  
14 many, many years. He was at Booz Allen after he left  
15 the National Security Agency. And in 2001, obviously  
16 when we had 9/11, there was a huge push back into the  
17 intelligence community to rejuvenate a lot of the  
18 human-based intelligence and analysis that was going to  
19 be needed to sort of track terrorism. And so he and I  
20 started working together then.

21 At the end of -- during the course of that,  
22 he was actually asked by the Bush administration to

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1 come back and serve as the director of National  
2 Intelligence, which he did in 2007. And then he  
3 returned to Booz Allen Hamilton in 2009. It was at  
4 that time when he came back, he and I had been quite --  
5 grew quite close as friends.

6 And one of the unique things and one of the  
7 most difficult things about Mike is actually getting  
8 time on his calendar, which actually is why he couldn't  
9 be here today because he had a previous engagement. But  
10 there was that window of opportunity when he first came  
11 back to Booz Allen for a couple of weeks where his  
12 calendar wasn't completely full and he had some time.

13 My background is in military intelligence.  
14 And so I lead that portion of the business. So one of  
15 the major clients I had is U.S. Central Command, which  
16 is down in Florida. And I was just happening to have  
17 lunch with him the day before and I said, "You know,  
18 they're really struggling with this whole resurgence in  
19 the scale of troops we had there, obviously."

20 There was a corresponding uptick in the  
21 intelligence and restructuring for all of that to  
22 prepare for the surge of troops there. I said, "You

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1 know, my client asked me to come down there and talk to  
2 them because we need to restructure the way we're going  
3 to support that operation. You know, wouldn't it be  
4 great if you joined me and came down?"

5           And so I think someone who got a sense of  
6 freedom that actually, "Hey, my entire day is not  
7 planned out tomorrow 15 minutes at a time. I could  
8 actually jump on an airplane and go down to Florida.  
9 That would be great." He said, "Christopher, I'll go  
10 down with you. This will be wonderful." I said, "What  
11 a surprise."

12           Could you imagine going to see a client and  
13 you've got the former DNI who only stepped down a  
14 couple of weeks ago to actually talk about such an  
15 important subject in context of the military and also  
16 for the nation? So we go down to National Airport. He  
17 walks up to the counter and buys a one-way ticket in  
18 cash. And we go and we stand in line.

19           So we're standing in line at National Airport  
20 and people are, like, "Oh, my god. Admiral McConnell,  
21 it's nice to see you. Oh, my god." You know,  
22 everybody's coming in. It's Monday morning. All the

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1 people are coming in from the Congressional hearings  
2 and everything and coming back from their  
3 constituencies. And, of course, a lot of people  
4 recognize him.

5           So we're standing in line. So, of course,  
6 we're just about to board the airplane and he gets  
7 pulled out of line, you know -- cash, one-way ticket.  
8 They pull him out.

9           So he's standing there. Okay. So I'm  
10 standing there alone and everybody goes, "Okay. Put  
11 them up." And, like, they're searching him and  
12 everything and said, "Okay. You know, where have you  
13 been? Where are you going? How come you're  
14 (inaudible)?"

15           And people walk by, "Hello, Admiral  
16 McConnell. Hi, hi." He's over there, pulled out of the  
17 line. So the TSA agent searching him looked up at him,  
18 you know, as he's getting down to his legs and he  
19 searching his pants to make sure he's not carrying a  
20 weapon, looks up. He says, "I saw you on TV last  
21 week." "Really?" "Yeah." He goes, "Oh, I appreciate  
22 it," put his hands down. "Whoa, whoa, whoa. I'm not

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1 finished yet."

2           So he sheepishly gets back in the line. I  
3 said, "Hey, welcome to the real world."

4           One of the other things that actually I've  
5 been focusing on as well that Booz Allen has, as I'm  
6 sure you've all heard about, the U.S. Cyber Command  
7 that's been stood up recently. What's really  
8 interesting about that is that the military didn't just  
9 create a command to fight in a different region of the  
10 world.

11           They actually designated a command to sort of  
12 harness all the elements of the different services and  
13 create a mantra and a capability around new tactics,  
14 techniques and procedures to engage in the cyberspace  
15 domain. And they actually articulated it as a domain,  
16 which is really a big deal, because they have air  
17 space, ground space, sea -- are all domains.

18           And so now, there's a whole idea that we're  
19 not just treating this as a sort of a technical  
20 problem, but we're actually going to organize to  
21 actually fight in this domain. But this cyber -- but  
22 that's new to the military. Cyber is not something

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1 that's new, nor has this ongoing battle for these new  
2 techniques that we perceive as being new -- they've  
3 been instantiated for many, many years.

4           And there's a silent lore that's been going  
5 on between nations over decades about trying to exploit  
6 each others' systems, take information, and also  
7 protect. So we usually classify cyber in those three  
8 elements: exploit, which is gaining access; attack,  
9 which is actually putting something into the system,  
10 which will either just corrupt the system, erase  
11 information that's in there or change the information;  
12 and of course, the other side of the coin is we also  
13 defend the system.

14           And the National Security Agency has been  
15 given the mission to do a lot of that, but inside the  
16 intelligence community. So they do it to protect the  
17 military-based systems. Cyber Command is going to look  
18 at that more broadly to defend the nation from external  
19 threats.

20           Now, what's happened over the years, because  
21 this has been the case, is that many major nations have  
22 gone out and invested millions of dollars and had

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1 created thousands of experts to actually build this --  
2 what we call malware, all the pieces that go into  
3 creating an attack.

4           So there's a whole point of probing a system,  
5 figuring out where the vulnerabilities are, where the  
6 patches are. There's this great term out there called  
7 "zero-day exploits," which is a way you've found your  
8 way into the system that nobody knows about yet. But,  
9 of course, once you do it, they figure it. They patch  
10 it.

11           But there are a bank of these things out and  
12 actually, they're like gold. People sell them as a  
13 commodity. So all the people who've worked for these  
14 nation states that have created all of this incredible  
15 technology, now, we see more of it being filtered out  
16 into the black market. And so what do we have?

17           So it used to be in the old days we had these  
18 huge sophisticated nation states that had thousands of  
19 people that were experts working on that. And then you  
20 always had this 15-year-old kid that was sitting in his  
21 parents' garage, the people that we're worried about.  
22 But there really wasn't anything in the middle.

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1           And so what's really changed is that the  
2 middle is starting to fill in. So you see criminal  
3 groups that have been out there and said, "Oh, this is  
4 a great way we can gain financial access into systems,"  
5 and sort of sell that capability. They are also  
6 actively engaged in the black market and they buy many  
7 of the things that trickle down from the nation states.

8           So those pieces of malware that have been  
9 used a couple of times are not so valuable. You know,  
10 they're available to be purchased and used.

11           We see activist groups, Wikipedia -- I'm sure  
12 you -- I won't go into all of that, but you've read a  
13 lot of that. And so you have different elements that  
14 are now banding together and developing new techniques  
15 to do that.

16           In addition, I don't want to obviate the fact  
17 that the nation states are becoming more active. So  
18 what's really interesting about that is that for the  
19 most part, here in the U.S., we don't think much about  
20 the intelligence community beyond national security.  
21 That's its major focus. That's its only focus.

22           In many other countries, intelligence

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1 communities and their agencies, not only do they have  
2 that mission, they also use it for economic espionage.  
3 So it's a part of their natural repertoire that they're  
4 in there, if they come across something, is they're  
5 poking around in systems that is proprietary -- is huge  
6 financial or competitive advantage for companies in  
7 certain industries.

8           They're -- they will -- they have an ability  
9 to share that with their industry base. And so they've  
10 actively been doing that for years and years and years.  
11 So what have we seen out of this? What's really  
12 interesting is that the DNI have published a document  
13 two years ago, which is the first time it really  
14 unclassified what we've known has been going on but it  
15 was the first time it was actually seen in unclassified  
16 state.

17           And what is that? We know that the Chinese  
18 are the most prolific and the most active in this area.  
19 And they use that to their economic advantage. And  
20 they have that synchronized with their trade partners.  
21 They create partnerships with U.S.-based companies. A  
22 lot of money flows initially out of that. Deals are

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1 won inside China.

2           And then, you know, two years into it, the  
3 deals sort of fall off a bit. Six months after that,  
4 there's a company that opens up down the street inside  
5 China that has the same capability. They start winning  
6 contracts. They have similar technology. Lo and  
7 behold, you know, there's been a whole transition and a  
8 whole life cycle to transition that intellectual  
9 capital over.

10           Out of this report it notes that the Russians  
11 are very good also. And they are very specific and  
12 targeted, so much as the Chinese are. Everywhere the  
13 Russians are very focused on what they're doing and the  
14 information they're trying to gather. And also, we see  
15 the Iranians are heavily involved. So what we see is  
16 less sophisticated nations that didn't have that  
17 capability have been able to utilize this black market  
18 and buy these capabilities and come up to speed quite  
19 quickly.

20           A good example of that is what we see  
21 happening in the financial services industry, that I'm  
22 sure you've read about over the last six months, these

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1 distributed denial-of-service attacks, which really in  
2 terms of sophistication is very low; on a scale of 1-  
3 10, maybe a 2, but obviously very effective in shutting  
4 down systems.

5           And what was most interesting about these  
6 particular attacks is how more sophisticated the  
7 attacks became. So we used to see distributed denial-  
8 of-service attacks that were basically 1 to 3-gig per  
9 second that would sort of take down a website. These  
10 were really on the order of anywhere from 80-gig to  
11 120, so it was huge.

12           It was going beyond just shutting down banks.  
13 It was overwhelming the communications grid that were  
14 leading to the banks. So how did the banks deal with  
15 this? They have proxies that they use. So they have  
16 almost a way that they dump that flow that's coming in.  
17 Once the flow overwhelms them, they pass it off to a  
18 third party. The third party tries to filter through  
19 that, figure out what's bad, what's good and send the  
20 good stuff to the bank and then dump the bad stuff.

21           Part of the problem is, all the banks, they  
22 use the same company to do that or same small group of

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1 companies to do that. So what happens? You saw the  
2 attacks were sequential. Guess what's going to happen  
3 next? They're going to be in parallel. Then we're  
4 going to see the secondary part of this collapse.

5 I thought I'd also give you a couple of  
6 facts. In 2012, there were 198 incidents reported to  
7 the IC Cert (ph). Forty-one percent of those were in  
8 the energy sector. And from what I just saw in the  
9 previous presentation, you are the biggest proponent or  
10 the biggest part -- component of the energy sector and  
11 clearly, a supply chain for the energy grid here.

12 Separately, of all the attacks that have been  
13 documented, 96 percent of them were not particularly  
14 difficult, not sophisticated. They didn't take  
15 thousands of man hours to pull together. I could  
16 either buy it for cheap. Someone mostly was  
17 inexperienced or not being disciplined on the defensive  
18 side -- left a hole open. And as I probe in there, I  
19 find something and I get through.

20 Attacker -- it's not that the attackers are  
21 not sophisticated, but why put any more effort into it  
22 than you need to if you can gain access in the simplest

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1 path forward?

2 Another interesting fact is 85 percent of  
3 those attacked took weeks to discover. And what's  
4 actually interesting is sometimes they take months to  
5 do.

6 So I talked earlier about the exploitation  
7 part. The exploitation part is the key fundamental  
8 foundation before you get to the attack. You have to  
9 gain access to the system. So it's often the case that  
10 someone gains access to the system and they can spend  
11 weeks or months probing around before they actually  
12 figure out what they're going to do and how they're  
13 going to do it. So they're actually lurking on the  
14 system for quite some time. But we never think to  
15 actually go into the system and try and find them.

16 Also what's interesting is that 97 percent of  
17 these attacks could be avoided by just taking simple  
18 counter-measures. Now, RSA, which is sort of the  
19 leading industry proponent of looking at different  
20 security elements in companies, and they work on  
21 different tools, started to think about this and wrote  
22 a report which covered that perimeter defense in itself

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1 is not itself.

2           So I'm sure everybody hear is familiar that  
3 you go through the process of -- as you boot up your  
4 computer, sometimes something comes in, an email comes  
5 in, and -- or if your computer's slow on getting  
6 started up and it usually says, "I'm updating the virus  
7 software." So what's actually going on? It's  
8 basically there's a look-up library. And so basically  
9 all these things that happened, they're compiled on a  
10 weekly basis and they're downloaded to your computer.

11           So everything that -- something comes in, an  
12 email comes in with an attachment, this library looks  
13 at it. And it says, "Is this on the library? Yes, it  
14 is. Okay." And then it gets quarantined. And then  
15 you go, "Oh, my god, something's quarantined on my  
16 computer." It just gets shunted to the side.

17           Or it says if it's not in the library, it  
18 comes through. And this is what the zero-day exploit  
19 is. What happens if it's not on a list? It just comes  
20 right through. And those are the pieces of technology  
21 that are most valuable. And so continuously managing  
22 these patches is what's critically important. So how

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1 do we do that?

2 We have this antivirus software that  
3 everybody knows about. We have these different  
4 firewalls that are in place that are supposed to do  
5 that. But all of that is basically a perimeter defense  
6 mentality. You know, it's much similar -- you know,  
7 more guards, more gates, you know, we'll be more safe.  
8 But at the end of the day, that in itself is not  
9 enough.

10 And I think the key point of what RSA noted  
11 is that we -- the time has come now where we need to  
12 look at threat-based intelligence, cyber threat  
13 intelligence. I really am more interested in knowing  
14 who's coming after me and spending a lot of my  
15 resources on that instead of just trying to blow more  
16 into what's actually happening on the perimeter and try  
17 and improve the strength from the outside.

18 So this is the challenge we had before us  
19 probably a year ago or so. And that's when Mike came  
20 to me and said, "You know, we need to figure out how to  
21 do this." We have a lot of people up in the National  
22 Security Agency. We're the largest contractor up

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1 there. We have some intellectual capital and figure  
2 out how to do this. It's most important also for the  
3 critical infrastructure of this country.

4           So, you know, we've obviously focused quite  
5 heavily in the financial services sector because that's  
6 where there's been a lot of activity recently. We did  
7 have to figure out and sit down, how do we actually do  
8 that? The NSA actually has a dual-loop system in the  
9 way they deal with these things. Something bad comes  
10 in, it's almost like a hospital. There's an emergency  
11 room.

12           You know, someone comes in. They're  
13 immediately hurt. You triage that. You know, heavy  
14 diagnostics -- emergency room -- how do I fix this? All  
15 I'm interested in doing is stabilizing the patient,  
16 fixing it. They've also got a second loop that really  
17 looks more strategically at best practices and how do I  
18 strengthen the system over time and position so I'm not  
19 in that situation?

20           So we extrapolated from that and we came up  
21 with a model that we call "dynamic defense." And the  
22 cornerstone of dynamic defense is this threat-based

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1 intelligence. Intelligence is a key element of this  
2 because it allows you to optimize your allocation of  
3 resources. So I'll let you in to a little secret. I  
4 said earlier that I've been in the military  
5 intelligence arena for ten years. I'm not actually an  
6 intelligence analyst. I have a consulting background.

7           And so when I sat down with all these intel  
8 analysts, as we were trying to gear up after the 9/11  
9 piece, I really wanted to understand, what's the  
10 secret, what's the holy grail? How is it this  
11 intelligence works? How do we actually do predictive  
12 analysis, which is what everybody wants?

13           And when you -- really boils down into three  
14 simple elements. The first is that you have bad  
15 actors. So you have people with intentions. And if  
16 you could really focus on the people with the bad  
17 intentions, you get a better idea about who might be  
18 acting against you. The second element is  
19 capabilities. What are the things that are out there  
20 that really could hurt you, independent of who actually  
21 might use them?

22           You know, a good analogy is if you think back

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1 to the Soviet Union, we had -- we didn't have a great  
2 deal of insight into what their intentions were on a  
3 day-to-day basis. And so we spent a lot of time and we  
4 built an entire intelligence infrastructure of a manner  
5 to look at their capabilities.

6           So as they built new bombers, new missiles,  
7 you know, we always have to have counter-measures to  
8 those things. And all of that was used to try and  
9 reverse-engineer what their long-term strategy was.  
10 When we moved over to counterterrorism, the problem was  
11 that there were so many capabilities available to  
12 terrorists; we really had to burrow in on the  
13 intentions directly. And that was really the huge lift  
14 in what the National Security Agency was doing in the  
15 SIGINT side of the business.

16           And so I'm sure you've seen the background on  
17 the capture -- or the killing of Osama Bin Laden. A  
18 huge portion of that was really all SIGINT-based. And  
19 where the human and the SIGINT really came together was  
20 a huge fundamental shift in the thinking and the trade  
21 craft of intelligence analysis that really hadn't  
22 existed during the Cold War at that level.

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1           And the third component that really comes  
2 into it is opportunity. Where is the most opportune  
3 time to actually strike? And so if we think about it  
4 in cyber, you're combining these three elements --  
5 would really give us insight and allow us to move past  
6 this perimeter defense into what we call this sort of  
7 dynamic defense capability.

8           And so now, we have -- and it's this  
9 intelligence capability, which is the first part of  
10 this -- really focuses on understanding where those  
11 triumvirate of things come together. So we -- for  
12 agencies and for companies, we look at their -- what we  
13 call their attack surfaces.

14           And the attack surface is not simply, you  
15 know, the network as it exists. It's how people engage  
16 in the network, how they use their mobile devices to  
17 get in there. It's how suppliers use it. It's how  
18 customers engage with them on the web, all these sorts  
19 of things. All of these places are creating  
20 opportunities.

21           And we look at the sets of individuals that  
22 we know through social network and social media

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1 analysis that are actively out there, you know, that  
2 have grievances or concerns around these individual  
3 companies or agencies that may be state actors,  
4 criminal actors, activists, all of those sorts of  
5 people. We categorize them and we watch them, their  
6 activities in open source.

7           And lastly, we're very familiar with the  
8 types of capabilities in this malware. What's really  
9 interesting about malware is it almost has a DNA  
10 pattern to it. Somebody will use it. And then what  
11 happens is they sell it and then somebody else changes  
12 it slightly and uses it for something else. And then  
13 it gets sold again and changed again.

14           But anyway, you can almost trace back all the  
15 people that have used it and who's had it last and what  
16 they've used it for. And so when you see the  
17 triumvirate of those three pieces coming together, you  
18 know, an opportunity opens up, there's a bad actor out  
19 there that has an intention, and all of a sudden, you  
20 can see activity around the capability, you know, then  
21 you get an idea that something could be coming.

22           And so after you determine that, there are

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1 basically two steps we walk our clients through. One  
2 is what we call our reactive response, which is  
3 basically -- and this is much like the emergency room I  
4 mentioned before -- where specific pieces of software  
5 that can go in and hunt down malware that exists on  
6 systems.

7           And so I'll tell you that in the entire  
8 history that we've had this capability that was  
9 developed at NSA -- and it's a non-signature base, so  
10 it doesn't work on a library. It goes through from the  
11 ground up and identifies the things that ought not to  
12 be there. And then there's a huge amount of human  
13 interaction to determine what the nature of that  
14 malware is.

15           In the six years that we've had this  
16 capability -- and we've deployed it over almost 100  
17 systems -- we have never once not found malware on any  
18 system, whether it be in the government or in the  
19 private sector.

20           The other path that we go along, so there's  
21 not an immediate emergency, is really around  
22 preventative actions. So these are our best practices

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1 that can be instantiated. What levels are you --  
2 there's a -- in the software industry, there's  
3 something known as a "capability maturity level" and  
4 we've adapted that into the cyber element, which  
5 actually can measure how mature is any individual  
6 organization or company and where do you stack up  
7 against your peers? And what level do you need to be,  
8 given the threat level that's against you?

9           So if you were informed by this intelligence  
10 around what's going on around you, how -- at what level  
11 do I need to be? And so we've got this going through 1  
12 through 5. And at any time, as the threat dynamically  
13 changes, you can make investment decisions about  
14 whether it's important to move up a maturity level or  
15 not. Also changes as based on companies have different  
16 suppliers.

17           I saw an interesting slide earlier on the  
18 last presentation about now exporting to China and  
19 India. I mean, there's always these great stories  
20 about, "We should just outsource everything to, you  
21 know, India. It's -- we're going to have great cost  
22 savings." And, you know, most of the people now -- you

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1 call, you know, to make an airplane reservation or you  
2 need helpdesk, you know, all of that stuff gets routed  
3 someplace else in the world.

4           But with that, there's some security risk  
5 that obviously comes into play when you extend your  
6 network over that. And no one's ever been able to  
7 quantify it. So the whole idea of this maturity model  
8 is you can make those trades and understand what you're  
9 doing. So you may realize cost savings in one area,  
10 but you're obviously going to have to increase in other  
11 areas to keep a modest risk level in play.

12           I guess the last component I would pull into  
13 this is that a lot of this intelligence that I talked  
14 about is really what we call "actionable intelligence."  
15 It needed to be folded in the construct of decision-  
16 making so it's valuable to the end user. I think  
17 that's a piece that's been missed in many components of  
18 intelligence.

19           The U.S. has a huge intelligence apparatus in  
20 place that monitors capabilities, manages overhead,  
21 assets that cost billions of dollars. And we track  
22 very well sort of nation states in their development.

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1 As I mentioned before, I think through the evolution  
2 that we've had since 9/11, the human intelligence in  
3 the SIGINT has become very, very good.

4           There's a vast quantity of data that's out  
5 there. Many times we hear the saying, "I'm drowning in  
6 data and starving for information. I don't know how to  
7 extract from all that data something that's  
8 actionable." So you have to have a context to really  
9 understand how that all plays together. So I guess the  
10 reason I bring that up is it's something that I know  
11 that military operators are always struggling with all  
12 the time. It's not that they want more information;  
13 they want the right information.

14           I bring this up because, as we say, we've  
15 learned a lot over -- about cyber over many, many  
16 years. And like I said, this has been going on for  
17 decades. A lot of those lessons learned can be  
18 immediately brought into the commercial sector. That  
19 can be valuable to you. As the infrastructure becomes  
20 -- the critical infrastructure becomes more and more of  
21 a target.

22           And I think the financial services is just

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1 the first step of what we're going to see. We're going  
2 to see significantly more activity by nation states  
3 that maybe are not the Chinese and the Russians who are  
4 more interested in stealing information, but sort of  
5 second- tier nations who would like to cause us harm,  
6 who would like to disrupt the services that we have,  
7 and can do it for -- asymmetrically for a minimal  
8 investment over time.

9           And those are the elements that we need to  
10 focus on. So every time you take a step in security,  
11 you're almost retarding your ability to be effective,  
12 because it's just not the cost associated with  
13 security, but everybody sees security as slowing things  
14 and as additional overhead. This is the type of thing  
15 that you want to ratchet that up when you know the risk  
16 is out there.

17           But if you can delineate that the risk is not  
18 there immediately, then you can ratchet that back down  
19 and gain the efficiency again. So there's always a  
20 constant balance that's going on between those two  
21 things.

22           And so I think tailoring this information in

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1 a way that's within context of senior decision-making -  
2 - just make those critical trade-offs -- is what will  
3 be successful at the end of the day. Because we can't  
4 just continue to add more and more layers of security  
5 and slow things down and add the costs. Because at the  
6 end of the day, that's not going to get us to that  
7 level that we wish to achieve.

8           And I think I'll just close by saying that I  
9 think many of these things have been realized and  
10 understood. There's legislation on the floor for the  
11 government to be actively involved to do something  
12 about it. There's a huge battle going on, financial  
13 services being at the forefront of this because of  
14 what's happened recently. They don't want to be overly  
15 regulated and so that's a problem.

16           And so that's been going back and forth and  
17 has stalled a lot of the elements that are in there  
18 about legislation. I think the greatest concern that  
19 potentially would be out there -- and David mentioned  
20 it before -- is this whole idea that there would be  
21 some cyber Pearl Harbor that would force the government  
22 to act.

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1           And when the government acts, regulation is  
2 the mechanism they would probably use to do that. And  
3 it's fair to say that it would probably be a  
4 significant rotation in that arena to compensate for  
5 what clearly would be a huge public outcry if things --  
6 if the -- you know, people didn't have money in their  
7 bank accounts, the lights didn't come on, you couldn't  
8 travel, and those sorts of things.

9           And so it's really important that industry be  
10 actively involved in helping to shape this legislation  
11 to tune it properly, to get you to the point where you  
12 can actually make these tradeoffs if you eventually  
13 start to build this capability yourself, to inform your  
14 senior leaders, to understand and mitigate risks, you  
15 know, as the threat changes. Thank you.

16           MR. DALTON: Hi. Stu Dalton with the  
17 Electric Power Research Institute. And I couldn't  
18 agree with you more on both the fact that in the  
19 electric power industry -- what was it? The greatest  
20 engineering accomplishment of the 20th Century -- not  
21 the 21st -- was the electric grid, the overall system.  
22 But it's a combination.

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1           It's a combination of physical, analog, and  
2 computer-aided systems put together. And it hasn't all  
3 been updated and it hasn't all been changed. We have  
4 things like -- that are marvelous inventions that allow  
5 us to control and modify those controls, programmable,  
6 logic computers -- or controllers, pardon me.

7           Good example, we know those can't be  
8 reprogrammed. And we know that the threat coming in  
9 from anywhere by anyone is something that we now have  
10 to worry about a lot more in our system. And EPRI is  
11 doing some R&D in this area and we're involved in a  
12 number of those areas.

13           But it strikes me that coal, which has a  
14 fundamental security in the fact that you can put a  
15 three-month supply on site -- oh, that's great. I  
16 mean, have -- I don't have to worry about the supply  
17 chain. It provides security. But what about the  
18 things that could impact the use of that -- impact the  
19 grid? We see the electric power industry as one of  
20 those areas that is trying to inform its upper-level  
21 management. We are making presentations to the board  
22 level advisors of EPRI because we see this as an

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1 increasing area.

2 Any comments, particularly for the electric  
3 power industry and coal and any nuances you'd like to  
4 add on that?

5 MR. LING: Yeah, I think you bring up a  
6 critical point. This whole idea of the move to the  
7 smart grid will fundamentally change the risk profile.  
8 I mean, I get -- that is a great example of what I was  
9 trying to talk about earlier, more in generic terms,  
10 but would be a great specific example of some of these  
11 tradeoffs that exist.

12 I used outsourcing as an example, but this is  
13 another one. So the electric companies -- okay, we're  
14 going to move to a smart grid. That's great. Homes  
15 are going to, you know, on demand have energy, share  
16 energy and all that. How is that going to be  
17 controlled? It'll be controlled through computers.

18 So all of a sudden, you have a centralized  
19 thing, where basically what you're worried about are  
20 these PLCs or SCADA systems that are maybe internal, at  
21 least physically to your own organization. Now, you  
22 have, you know, millions of these small computers

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1 running into almost everybody's house that are somehow  
2 integrated into this network that are either used for  
3 forecasting, for demanding and those sorts of things.

4           And there's going to be a huge tradeoff. So  
5 when the decision is made to implement that, the  
6 corresponding security balance to that has to be,  
7 "Okay. Now, what am I going to spend and how am I  
8 going to develop security architecture around that?"  
9 And that's just not a technical piece. It's policy.  
10 It's people. It's training. It's all of those  
11 elements that need to go into that.

12           We did an analysis that said, you know, "What  
13 are the top 50 companies that are spending against  
14 cybersecurity at the moment?" What's really  
15 interesting is there's no energy companies in the top  
16 50 today. But in ten years from now, there'll be  
17 three. So that -- and of the other 50, none of them  
18 really changed. That is the biggest change in any one  
19 industry in the top spending -- or the top realization  
20 that cyber is going to have -- is going to be the  
21 biggest threat and will require the biggest spin-up in  
22 any sector.

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1 MR. DALTON: Mr. Ling, is this on?

2 MR. LING: Yes.

3 MR. DALTON: All right. Thank you. Are you  
4 able to say or do you care to say that within, let's  
5 say, the next five years there could be one way or the  
6 other, somehow or the other, a cyber attack on the  
7 United States power grid which would shut all the power  
8 off in the country and this either from some zany  
9 operating out of his attic in Sweden or by  
10 conspirators?

11 Is it possible that in the next five years we  
12 will see all the lights go out and possibly stay out  
13 for several days?

14 MR. LING: I don't know if I would go so far  
15 as to say it would be directed at the power grid. But  
16 I will say this. And you and I brought it up when we  
17 were discussing this before. Usually, in any industry,  
18 there is a clear element of a single point of failure.  
19 And if something were to happen drastically there, it  
20 could shut everything down.

21 The -- I'll use the financial services as an  
22 example. In the U.S., economy is \$14 trillion a year.

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1 There are two banks in New York that handle \$7 trillion  
2 a year in transactions a day. If anything happened to  
3 any one of those two banks, it would paralyze the flow  
4 of money, not just inside the U.S., but globally.

5           And so the ability to identify those key  
6 elements -- very I said -- I'm sure in the power  
7 industry there are probably similar examples. There  
8 are a few key critical notes. And either not having a  
9 redundancy around that, not developing any policies  
10 around that -- and again, if I go back to the example I  
11 used before, 97 percent of all attacks were not highly  
12 sophisticated.

13           So it's not that, you know, someone's going  
14 to spend, you know, 40 people working two years to try  
15 and take down the power grid. It could be something  
16 simple just in one of these critical things. I think  
17 it's fair to say that there'd probably be a significant  
18 cyber event in the next five years. I don't know if it  
19 would be in this particular industry.

20           But we're certainly seeing indications of the  
21 sophistication and the quantity and severity of those  
22 attacks certainly increasing over time, almost on a

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1 six-month basis.

2 MR. DALTON: I'm not quite sure I understand.  
3 I'm paying close attention. The -- just as you're  
4 concerned about the financial underpinnings and the  
5 country being suspended by it being, you know, diverted  
6 or somehow nullified, as -- I think everybody in this  
7 room knows that the electrical power grid in the  
8 country isn't in the best of shape first of all.

9 And I'm not sure how it's going to be  
10 responding to increased demand. But the power grid is  
11 controlled from several physical points in the United  
12 States. I believe I'm correct in that statement. Now,  
13 why can't these crazies get into those points, as you  
14 have alluded, the nodes, if you will, and tweak it in  
15 such a way and just order the thing to shut it down?

16 You're -- are you saying that -- it's  
17 possible; isn't it?

18 MR. LING: Yes.

19 MR. DALTON: Okay, thank you.

20 MR. LING: It's just not possible to -- by  
21 the way, it's not possible just to shut things down.  
22 It's possible to go into systems and change the

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1 information. Right? So I think Stuxnet was a great  
2 example of that. It wasn't that anything got shut down.  
3 It's that things were changed and people didn't really  
4 even know about it.

5 MR. FASSBENDER: Yeah, it gets back to, I  
6 think -- this is Alex Fassbender, Ecovia Corporation.  
7 It gets back to what President Lincoln said. He's not  
8 so worried about what he doesn't know as much as he's  
9 worried about what he knows for sure that simply isn't  
10 so.

11 The question I have for you relates almost  
12 directly to what you were talking about, the two banks  
13 and the nodes that previous questioner asked.  
14 Centralized versus distributed systems -- have you done  
15 any studies on the resiliency of centralized systems  
16 versus distributed systems? And is there -- are there  
17 any lessons to be learned there?

18 MR. LING: I'll tell you, in the studies that  
19 we have done, when we look for opportunities, if you're  
20 the attacker or if you're the defender, what we call  
21 vulnerabilities, oftentimes, it's not so much the  
22 technology or whether the systems are centralized or

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1 decentralized; it's the people that engage with the  
2 systems. It's the thumb drives. It's the patching.  
3 It's the policies that are in place or the lack of  
4 training, the passwords.

5           It's all very, very simple things, actually.  
6 I mean, if we could just clean up those things, it  
7 would make a huge difference. So before you even get  
8 to the technology architecture, you have those pieces.  
9 What's really interesting though about the technology  
10 architecture, since you bring it up, is we have done  
11 excursion studies on saying, "You know what? We don't  
12 know anything about this company. Let's put our intel  
13 analysts on it and see what we can figure out about  
14 what we do we know -- what could we delineate about  
15 what their architecture looks like?" "Is it centralized  
16 or decentralized? What are the components?" You go to  
17 LinkedIn. You find the senior people. You look at  
18 their resumes. You see who they work with. You see  
19 who they're friends with. You can also piece together  
20 exactly the widgets of technology that are being used  
21 by companies. And once you know the technology, then  
22 you go back and you find out what the exploits are.

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1           Then you can go out into the black market and  
2 buy what you want. And I mean, it is a pretty  
3 transparent process. And I'll tell you, centralized or  
4 decentralized, vulnerabilities exist in both.

5           MR. FASSBENDER: Thank you.

6           MS. GELLICI: One last question. Go ahead,  
7 Doug.

8           MR. BAJURA: Thank you, Janet. I'm Dick  
9 Bajura. I'm with West Virginia University. I was  
10 particularly intrigued on your analysis of how things  
11 happen internationally. You get money for the first  
12 two years, then interest goes away and then the other  
13 company is founded in the other country.

14           From a practical standpoint, how could one  
15 tell -- what are the lessons that you have learned, for  
16 example, and how do you sense when these things are  
17 happening so that you might alter your interactions  
18 with people so that you can figure out how to avoid  
19 getting your technology taken away?

20           MR. LING: Yeah. We don't produce anything  
21 as a company so it's not for ourselves. Obviously, we  
22 have clients that do. And I think that right now, it's

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1 a policy problem. And it really becomes a business  
2 decision about how you're going to do business.  
3 Obviously, China is an area that's booming and lots of  
4 people want to do business.

5           You go there. You know, they want you to  
6 have a local presence. You open an office. Somebody  
7 shows up and says, "Okay. We want to put this black  
8 box on your network." "Well, we don't want to do  
9 that." "Well, then, okay. Then you can be registered  
10 to do business here." Now, it becomes a trade. So  
11 companies say, "Okay."

12           To get your point, then they say, "Okay.  
13 Well, we'll air-gap that network. That network is  
14 separate. We'll have to physically take everything off  
15 and move it and put it over here. I mean, over time it  
16 becomes a major problem. This is a long-term strategy  
17 on the adversary's side.

18           Because the way it works is, if you want to  
19 do business there, you have to have presence there. If  
20 you have presence there, you have to comingle and find  
21 a local partner to work with. So intellectual capital  
22 gets traded that way or it's taken that way.

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1           You know, we've had issues where attorneys  
2 have gone in to represent large-scale clients to do  
3 deals in there. And as the attorneys come in, they  
4 bring their laptops with them. They have their whole  
5 negotiation strategy in there. They go to the hotel.  
6 They plug in to check the email. Guess what? The  
7 strategy's gone.

8           I mean, it is a prolific problem at the  
9 moment. And the question is, if you want to do  
10 business there, there's got to be a balancing act. The  
11 other part of this is that once you realize that's  
12 something's gone wrong and you want to do something  
13 about it, you want to take legal action, it has to be  
14 dealt with in the Chinese court.

15           So the Chinese courts don't see anything, but  
16 Chinese companies. So this whole thing has eventually  
17 got to be resolved. It's a very complicated problem.  
18 Again -- I think right now we haven't even gotten to  
19 the technical aspects of it. It's really got to be a -  
20 - it's a policy issue at the moment that's got to be  
21 dealt with.

22           MS. GELLICI: Christopher, thank you very

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1 much.

2 MR. LING: Thank you for having me.

3 MR. LONG: Thanks, Christopher.

4 Our next presentation is about nuclear-  
5 enhanced coal-to-liquid fuels production. And we have  
6 two speakers that are going to tag-team. First is Fred  
7 Moore. He's president of Manufacturing Excellence  
8 Consulting and executive director emeritus, NGNP  
9 Industry Alliance, Limited. Fred's currently the  
10 president of manufacturing for that company and  
11 executive director emeritus for the Next Generation  
12 Nuclear Plant Industry Alliance.

13 His consultation company specializes in  
14 safety and reliability consulting in the manufacturing  
15 industries. Previously, Fred was global director of  
16 manufacturing and technology for the energy business in  
17 Dow until he retired in 2012. In this role, he was  
18 responsible for the safe and reliable production of  
19 power, steam and other utilities for Dow globally,  
20 which represents approximately \$8 billion in assets, or  
21 more than 10 percent of Dow's asset base.

22 Fred's a graduate of Purdue University. He

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1 began his career with Union Carbide in 1975. He's been  
2 a corporate media spokesperson, lobbied at the state  
3 and federal levels of government, served on a joint  
4 venture board of directors, and has been chairman of or  
5 served as board member of several state and industry  
6 trade association groups.

7           And Don Newell is from Kentucky Energy and  
8 Environment Cabinet. For the last six years, Don has  
9 been acting director for fossil energy development in  
10 the Kentucky Energy and Environment Cabinet. Prior to  
11 that position, Don spent eight years with Kentucky  
12 Division for Air Quality, including six years as the  
13 air permitting manager.

14           Don has a Bachelor of Science degree from  
15 Purdue as well and a Master's Degree in Management from  
16 the Krannert School of Management at Purdue. His work  
17 experience prior to employment by the Commonwealth of  
18 Kentucky includes the microelectronics and aluminum  
19 industries and a lengthy stint in the United States Air  
20 Force.

21           And a lesser-known fact -- and you'll have to  
22 talk to him after the meeting -- is he used to be a

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1 hooker. So let me welcome our next speakers, Don and  
2 Fred.

3 MR. NEWELL: John, thank you, I think.

4 First, let me clarify. I am not Fred Moore.  
5 Though, after John's introduction, I'm not sure that I  
6 wouldn't prefer to be Fred. Let -- yeah, let's go  
7 ahead and clear the air. John has a couple of sons  
8 that have played rugby and I used to play rugby. And  
9 one of the positions that I played -- actually, my  
10 specialty -- was what's called the hooker. And he's  
11 the guy in the front of the middle of the scrum.

12 So that was quite a surprise, but thank you  
13 for that introduction.

14 Now, to try to get back on track. Over a  
15 year ago, our cabinet secretary, Dr. Len Peters, agreed  
16 with the Next Generation Nuclear Plant Industry  
17 Alliance that Kentucky would participate in a study of  
18 coal-to- liquids industry, assisted by nuclear energy  
19 and cut the carbon footprint.

20 And how do I get this slideshow started?

21 Okay. There, it's starting now. What moves it  
22 forward? Sorry about that. I'm not very technically

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1 competent either.

2           But he agreed to do that and he did it for  
3 one simple reason: Kentucky is a coal state. Between  
4 the jobs, between the amount of electricity that's  
5 generated in Kentucky from coal, between its impact on  
6 the tax base, gross domestic product, et cetera, et  
7 cetera, there is not a citizen in the state of Kentucky  
8 that is not touched by coal.

9           Now, we heard Secretary Smith make the  
10 comment that technology is needed in the 21st Century  
11 to keep us viable and energy developing. If we're  
12 going to keep coal as one of the options in the 21st  
13 Century, then we're going to have to deal with the fact  
14 that, as the Secretary pointed out, we will be  
15 operating in a carbon-constrained world.

16           On a big picture viewpoint, that leaves us  
17 with two options. Either you control the CO2 that you  
18 make or, as some of our commenters have pointed out as  
19 an option, you avoid making CO2, either through higher  
20 efficiency, through better materials and such, whether  
21 it's through upgrading existing power plants, new  
22 technologies and new ones -- whatever, you can avoid

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1 making that CO2.

2 Nuclear-assisted coal-to-liquids industry  
3 addresses directly that option of avoiding CO2 at a  
4 potentially lower cost than would be incurred by trying  
5 to control CO2 after it's made. Now, why does Kentucky  
6 care about that, specifically down more on the  
7 grassroots level? We have two reasons. And I'm not  
8 going to read you these slides.

9 But I would like to point one thing out on  
10 the Paducah Gaseous Diffusion Plant slide. Paducah  
11 Gaseous Diffusion is going to close inside of a year.  
12 That's 1100 jobs in Kentucky that, with a \$160 million  
13 payroll, is \$145,000 a year on average. That is unique  
14 in Kentucky. And we are going to lose that employer.

15 The second reason is Eastern Kentucky and  
16 Eastern Kentucky Central Appalachian Coal. Again, I  
17 don't believe that I have to highlight to this group  
18 what's going on in Appalachia's coal region or why it's  
19 been going on. But again, one thing to point out, the  
20 result of all of these factors is that production is  
21 down 25 percent in the last year.

22 This year, during the first four months, it's

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1 keeping on that tailspin decrease. And the possibility  
2 exists that, with the regulatory environment, the other  
3 competitions of oil and natural gas and such, there may  
4 not be a recovery in the traditional coal, i.e., power  
5 industry.

6           So we're on board with taking a look for new  
7 markets. We're on board for taking a look at new ways  
8 to achieve the goal of keeping coal in the energy mix.  
9 That's what led to our collaboration with the Nuclear  
10 Alliance.

11           And now, I'll turn it over to Fred. And he  
12 will outline the results of that study and talk about  
13 the opportunities that are available.

14           MR. MOORE: Thanks, Don. I'll stand back  
15 here.

16           Let me just start very briefly. In my energy  
17 role with Dow, I became interested and actually  
18 involved in this technology in 2007, because I gave a  
19 talk on energy at the NEI, Nuclear Energy Institute,  
20 annual meeting. And then-Assistant Secretary Dennis  
21 Spurgeon for the Office of Nuclear Energy came up and  
22 grabbed me by the arm and said, "I need you to meet

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1 some people."

2 I'll tell you at the beginning two things  
3 that attracted my attention about this high-temperature  
4 gas reactor technology. One was its intrinsic safety  
5 and I'll elaborate on that further in a minute. And  
6 two, it was the first technology that I had seen -- and  
7 as owner of the energy technology in Dow that had  
8 ability -- the ability to be a game changer in terms of  
9 low carbon production of high-temperature process heat.

10 The alliances -- when this began, the  
11 alliance was a group of six of us. It's expanded since  
12 then and it continues to expand. Certainly big  
13 companies like Dow and ConocoPhillips are large energy  
14 hogs. I mean, Dow consumes for energy and feed stocks  
15 the equivalent of about 900,000 barrels of oil a day.  
16 That's about 0.15 percent of the world's energy supply.

17 Energy's a big deal. Right. Conoco, a big  
18 player in the tar sands. The Petroleum Technology  
19 Alliance of Canada, which is a consortia of all the  
20 major oil players that are extracting bitumen in the  
21 oil sands. I don't know if you know this, but with the  
22 SAGD process, to extract about one barrel of oil or 6

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1 million BTUs, it takes about 1.3 million BTUs of  
2 natural gas. And that goes out as CO2.

3           Two of the largest nuclear system suppliers  
4 in the alliance, Areva and Westinghouse, a number of  
5 nuclear suppliers at Grafite (ph) and other  
6 technologies and other interested parties including one  
7 of newest numbers, State of Wyoming, which we've also  
8 done work with on nuclear-assisted coal-to-liquids. And  
9 I'll talk a bit more about both of those in a minute.

10           The real opportunity that I'm here to  
11 discuss, particularly with all of you tied to coal, is  
12 that there truly is an opportunity for, I think, long-  
13 term use of the coal for other than have been  
14 traditionally applied. Although, certainly there's  
15 coal-to-liquids applications that exist today. In  
16 fact, Dow Chemicals has been working on their coal-to-  
17 liquids facility with Shenhua in Yulin, China for some  
18 time. Right. And that's continuing to progress.

19           But the nuclear assist brings a unique  
20 application and I would argue it brings a very large  
21 multiple -- and the return on the coal assets. And  
22 I'll talk more about that in just a moment.

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1           Both of these studies, the studies for the  
2 State of Wyoming and the State of Kentucky are on our  
3 website. If you're interested in getting access to  
4 them, drop me your card. I'll send you the link direct  
5 to the website so you don't have to fuss around and  
6 look for them but they are available. And they both  
7 fundamentally looked at the kind of generational  
8 approach, which would be, for example, the first coal-  
9 to-liquids facility might be just with existing  
10 technologies.

11           And as people have spoken about before,  
12 because you're using an oxygen process, gasification,  
13 take the CO2 for EOR. One of the limits of EOR in our  
14 view is that you -- as we looked at it, for example, in  
15 the State of Wyoming is, you know, after you build the  
16 first two or three 50,000-barrel-a-day plants, there's  
17 no more EOR capacity available in the state. So what  
18 do you do?

19           Or what happens if you get a price of carbon  
20 or you're faced with sequestration? And I think I  
21 heard every -- just -- I was up in Chicago the day  
22 before yesterday. And Robin -- it eludes me -- was

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1 talking about CCS and said, you know, probably \$100 a  
2 ton current cost estimates.

3 MR. DALTON: Billion?

4 MR. MOORE: Yeah, the billion. Anyways --  
5 and we're always wrong. We're always low. We're  
6 probably low on our capital estimates, too. But I'm  
7 going to talk specifically about that transition to the  
8 high- temperature gas reactor assisted coal-to-liquids.

9 Let me briefly tell you why this technology  
10 is different than any other nuclear technology you're  
11 probably familiar with. The high-temperature gas  
12 reactor, first and foremost -- and I will tell you  
13 that's the reason that companies like Dow and  
14 ConocoPhillips even consider it is because it's  
15 intrinsically safe.

16 And that means that there are no scenarios  
17 where a catastrophic event would cause people outside a  
18 very small exclusion zone to have to shelter in place  
19 or evacuate, which means that you could site one of  
20 these near to or adjacent to a multibillion dollar --  
21 \$10, \$20, \$30 billion integrated petrochemical complex  
22 and not worry.

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1           Why is it intrinsically safe? It's really  
2 fairly simple. And I'm not a nuclear guy, but I've  
3 been able to figure it out. One, the entire components  
4 in the inside of the reactor, the ceramic fuel and the  
5 pyrolytic graphite are not reacting with anything in  
6 the system. It's helium cooled. It has a negative  
7 reaction temperature coefficient, which means as it  
8 heats up, it actually physically shuts itself down.

9           In fact, it's been demonstrated with  
10 prismatic designs in Japan and the pebble design  
11 recently in China. Andy Kadak, who is a former MIT  
12 professor in nuclear witnessed the test in China about  
13 two years ago. Seven of these reactors of various  
14 designs have actually been built and operated,  
15 including one in the U.S. at Fort St. Vrain from '79 to  
16 '89.

17           You literally could decide you're having a  
18 bad day and everybody could leave and nothing bad would  
19 happen. As the reactor heats up, it actually shuts  
20 itself down well before any of the elements in the  
21 reactor, the ceramic fuels or pyrolytic carbide -- or  
22 carbon are impacted.

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1           It has control rods, but don't need to drop.  
2 The spent fuel is air cooled. It has no active or  
3 passive safety systems. That is a true Gen IV reactor  
4 system. The other key attributes that come with this -  
5 - it said, "Okay. Now" -- the intrinsic safety says,  
6 "I'll go let you -- I'll consider having one of these  
7 next to where I'm having the large integrated  
8 petrochemical complex."

9           It's two-fold. One is it provides high  
10 temperature process heat. Reactor at a temperature of  
11 750 C. That means I can just place virtually all my  
12 natural gas-fired high-temperature process heat --  
13 right. I can make 1500-pound steam for a cracker very  
14 easily with this, with sufficient superheat. That's  
15 something you can't do with a light water reactor --  
16 either the larger or small modular designs.

17           Secondly, if you look at the size, it's 625  
18 megawatts thermal. That's about the same size as an F-  
19 Class gas turbine/steam turbine combination. That  
20 means so that if you would put in a four pack or six  
21 pack of these to supply high temperature process heat  
22 and power and a cogeneration application, it -- you

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1 could actually have one down -- one trip and still have  
2 two other supplying reliable steam to your facility  
3 connected to the grid.

4           So what's this got to do with coal? Well,  
5 today if you wanted to do a coal-to-liquids facility,  
6 this is an example of a traditional Fischer-Tropsch --  
7 includes a water shift reaction -- most of you are  
8 probably familiar with that. In order to get the right  
9 CO/hydrogen balance, you've got to throw some water in  
10 there. You convert a whole bunch of CO to CO<sub>2</sub> in the  
11 process and make hydrogen.

12           The net result is to have 25,000 barrels a  
13 day of diesel coming out the back end. It takes about  
14 14,000 tons a day of coal going in the front. And  
15 guess what? Seventy percent of the carbon ends up  
16 going out the stack as CO<sub>2</sub>.

17           Nuclear assisted does two things. One is it  
18 - - using the nuclear plant to produce high temperature  
19 steam electrolysis to produce the hydrogen allows you  
20 to avoid the water shift reaction. That means that you  
21 don't have to do any discharge of CO<sub>2</sub>. In fact, this  
22 is almost virtually no CO<sub>2</sub> emissions from this

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1 facility.

2 MS. GELLICI: We are not picking up  
3 everything on the (inaudible).

4 MR. MOORE: Yeah. You want me to go to the  
5 mike? All right. You can turn me off. I'll talk at  
6 the mike.

7 MS. GELLICI: Thank you.

8 MR. MOORE: Sure. So for literally roughly a  
9 third of the same amount of coal, you get the same  
10 amount of production out the back end. This is not  
11 unique but it is special. To give you an indication,  
12 the State of Wyoming produces about 1.1 million tons a  
13 day of coal today. If you attached this scenario to  
14 that 1.1 million tons a day of coal, you could produce  
15 6 million barrels a day of transportation fuels --  
16 roughly 50 or 60 percent of the U.S. demand.

17 I won't get into the graph here but suffice  
18 to say that, you know, there -- you can probably do a  
19 traditional coal-to-liquids facility with EOR somewhere  
20 in the \$80-a-barrel range, compete with oil at \$80 a  
21 barrel. The nuclear-assisted high-temperature steam  
22 electrolysis, we currently -- our economics look to be

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1 in the \$140-a-barrel range.

2           So that means that if -- well, if it's \$140,  
3 you could make money coming out the back end on the  
4 synthetic fuels plant with the nuclear assist. That's  
5 without a price for carbon. If the alternative is  
6 paying \$100 a ton to put in the ground or \$50 a ton  
7 tax, this becomes economic well below \$100-a-barrel  
8 oil.

9           Just on a relative time line, there's  
10 probably been about \$500-\$600 million spent by the  
11 Department of Energy so far on helping put together  
12 fuel qualification, graphite qualification. And I  
13 guess everybody realized it's a large economic lift for  
14 any new nuclear technology. Financing, like everybody  
15 else these days, is a challenge but we're still hoping  
16 to get this reactor technology commercialized in the  
17 mid- 2020 time frame.

18           So the end of the day, my ask of this group  
19 is, you know, are you interested? If you are  
20 interested, I'd certainly be more than willing to have  
21 a longer-term -- a longer discussion about what the  
22 opportunities this could bring to your industry, and

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1 particularly in taking advantage of coal that's now  
2 being displaced, either through the shut-down of  
3 existing, small, inefficient plants or may potentially  
4 be the subject of a future regulation or other costs  
5 that would drive this.

6           This is a strategic view. And I'll give you  
7 an example. Dow Chemical is being strategic in its  
8 view and support of this, having been the first  
9 executive director and now executive director emeritus.  
10 But this is actually mentioned in Dow's energy plan for  
11 America. It was in the 2010 plan and it's in the  
12 current 2012 plan that's on their website.

13           Because again, I would say companies with  
14 foresight, who understand that some inevitable  
15 addressing of carbon will come to fruition -- if you're  
16 strategic in that viewpoint, this ought to be  
17 considered as optionality. And so the alliance  
18 continues to look for other partners to work with us  
19 and -- whether it's through studies or joining the  
20 alliance or going up and advocating on the hill to get  
21 some of the DOE funding.

22           So with that, I will close and open it up for

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1 questions.

2 MR. NEMETH: Fred, I'm Ken Nemeth with the  
3 Southern States Energy Board. Just a question  
4 regarding the regulatory side. How do you see all  
5 those pieces fitting together, NRC having to make  
6 decisions about the nuclear side? And then, you know,  
7 what -- we throw EPA into the equation on the other  
8 side. What -- how hard is this going to be?

9 I mean, I see your last slide on, you know,  
10 state opportunities and working with states. But to  
11 me, the real crux of the matter is going to be will NRC  
12 approve this? You might be able to give us a little  
13 background on Fort St. Vrain and --

14 MR. MOORE: Sure.

15 MR. NEMETH: -- you know, that having been  
16 shut down and so forth and where we go from here.

17 MR. MOORE: Well, I mean, Fort St. Vrain was  
18 a little bit different design but similar in terms of  
19 being a high-temperature gas reactor. Now, first of  
20 all, nobody associated with this -- and again, I'm not  
21 a nuclear expert -- but including Idaho National Labs  
22 and others, the nuclear system suppliers like

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1 Westinghouse and Areva don't believe that this is a  
2 technical issue in terms of it being licensed. It's  
3 really an economic hurdle at this point to get the  
4 license.

5           The other thing that this facility does is --  
6 it's modular in design so that it's actually -- it's a  
7 helium-cooled reactor with a helium-to-steam  
8 intermediate heat exchanger. That's the nuclear  
9 island. Everything else is going to be outside the  
10 nuclear island. So, you know, from a license  
11 perspective, they're going to be the same license for  
12 every reactor or set of reactors.

13           I don't want to dismiss or underestimate the  
14 amount of effort it's going to require to get the first  
15 license for this because recognize that today every  
16 reactor that's operating in the U.S., all 104 -- or  
17 103, I think they're shut -- Dominion's shutting one  
18 down or it has -- but, you know, are water reactors.

19           Fully half of the current Part 50 or Part 52  
20 licensing requirements do not apply to this technology.  
21 Okay. It does not apply because there's no water. Now,  
22 all those things you worry about with water don't

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1 exist. Lots of work, but we all think it's very  
2 doable.

3 MR. BAJURA: Hi. I'm Dick Bajura with West  
4 Virginia University. One of my first jobs  
5 professionally was with the Babcock and Wilcox Company  
6 and their pressurized water reactor. In listening to  
7 your presentation, if you could produce a hot steam at  
8 750 degrees C, what are the economics of using your gas  
9 cold reactor technology for just regular steam  
10 generation using the heat exchangers as in PWR  
11 technology?

12 MR. MOORE: Great question. And the answer  
13 is it's actually quite economic in most parts of the  
14 world today for production of high-temperature process  
15 heat. That wasn't the focus of the talk today, but we -  
16 - our current estimates that we've done and we think  
17 are reasonably conservative say that this technology  
18 for producing process heat, i.e., steam, is competitive  
19 in the \$5-\$7-dollar natural gas range -- \$5-\$7 in the  
20 MBTU natural gas range with no price for carbon.

21 Each 50 -- each \$10-a-ton price for carbon  
22 makes that more competitive by about \$.50 in the MBTUs.

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1 So a \$50-a-ton price for carbon would make that  
2 competitive from about \$2.50-\$5.50 in the MBTUs.

3           On electricity basis, it competes at about  
4 the light water reactor level today, at about \$85 or  
5 \$90 a megawatt. It is -- it does have some other  
6 unique things. It -- for those -- for power  
7 production, it can operate in arid regions and be air  
8 cooled without the significant efficiency losses that  
9 occur with a light water.

10           A light water reactor would have such  
11 enormous efficiency losses. It would be difficult to  
12 do air cooled because, again, the return temperature on  
13 this high-temperature gas reactor is between 325 and  
14 350 C. So you can still do effective air cooling, but  
15 very little -- you know, virtually no water condensing  
16 load would be required. Good question. I'm happy to  
17 talk about that.

18           Like, Dow's looking at it from cogen  
19 applications.

20           MR. ALI: Sy Ali with Clean Energy  
21 Consulting.

22           MR. MOORE: Yes.

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1 MR. ALI: Your presentation is based on the  
2 whole premise that HTGR will be a product to help the  
3 coal industry. How close to commercialization is your  
4 HTGR?

5 MR. MOORE: We were -- we currently see that  
6 the first reactor could become operational in the mid-  
7 2020 time frame. That assumes that we continue to get  
8 the funding in the intermediate process to complete the  
9 fuel qualification and graphite qualification and  
10 materials qualification.

11 Fuel testing and graphite qualification is  
12 already underway. Part of the -- you know, as I said,  
13 there's probably been about \$500 million spent at Idaho  
14 National Labs with -- through that advanced test  
15 reactor. The fuel has been through some rigorous tests  
16 already.

17 Babcock and Wilcox actually has helped  
18 develop -- actually developed the TRISO fuel that's  
19 used in this reactor. It took -- well, it used to be  
20 an art and turned it into a science.

21 So again, the -- one other interesting thing  
22 about this technology: at these temperatures, there

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1 really aren't any metallurgical issues. I mean, there  
2 are chemical companies today that use superheated steam  
3 at 800 degrees C. So -- and the alloys that would be  
4 required for this technology exist. It's not a  
5 stretch. The ceramics that are used have already been  
6 used in high-temperature gas reactors around the world.

7           And the ceramic fuel is actually proving to  
8 be very robust and actually is the basis for the  
9 inherent safety.

10           MR. FASSBENDER: Alex Fassbender. Kind of a  
11 nerd question, but could you comment about the fuel and  
12 its life cycle and kind of contrast that with the fuel  
13 for a light water reactor?

14           MR. MOORE: Again, I'm not a nuclear expert.  
15 So -- but I know enough to be dangerous. The fuel  
16 actually uses a slightly higher enrichment than light  
17 water reactors, which are -- they say, what, 3, 4, 5  
18 percent. So it's above -- I think it's going to be  
19 above 10, has to be less than 20.

20           It actually -- the initial tests that have  
21 been completed at Idaho National Labs show that it has  
22 probably about an 18 percent fuel burn-up versus a 3

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1 percent fuel burn-up in the light water reactor. So  
2 it's about six times more effective.

3           And you've got to remember that for every  
4 light water reactor fuel element that's been put in  
5 since they've started in the 1970s, only 3 percent of  
6 the uranium fuel was actually utilized. The other 97  
7 percent is still sitting in dry cask storage at each of  
8 the nuclear facilities.

9           Storage is usually an issue I get questioned  
10 about when I talk about this and even from my wife. And  
11 I remind her that it's -- if you took all the fuel --  
12 as Admiral John Grossenbacher, who's the director of  
13 INL, has said that if you took all the fuel -- spent  
14 fuel over the 25 years and stacked them on top of each  
15 other on a football field, you'd -- it would be 20 feet  
16 high.

17           So, yes, waste is an issue, but volume's not.  
18 And those people who are steeped in nuclear say it's  
19 really a future resource. And we have not reprocessed  
20 any of that fuel, unlike Japan and France do today.

21           MS. GELLICI: Thank you, Fred. Thank you,  
22 Don.

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1 MR. LONG: Now, for some Council business. I  
2 would like to ask Dave Surber to come back up as  
3 chairman of the Council's Communications Committee to  
4 give us a short report on yesterday's committee  
5 meeting.

6 David?

7 MR. SURBER: I will take my cue from the way  
8 you introduced me as giving a short talk. The three  
9 B's of public speaking are be brief, be sincere and be  
10 seated. The -- I will confine myself to say that in  
11 everyone's packet is what is, in fact, my report.

12 The agenda for the Communication's Committee,  
13 which met yesterday afternoon for about an hour, had --  
14 the first eight points are what we talked about. You  
15 can refer to them and we'd be happy to hear from you on  
16 your reaction to those. And then as important was a  
17 one-page and seven-point plan of work of the  
18 Communications Committee of the National Coal Council  
19 for 2013 and beyond.

20 And I'll confine myself to just the first  
21 paragraph. "This," meaning the plan of work -- "This  
22 in order to increase public awareness of the existence

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1 of and the goals and work of the National Coal Council  
2 and more widely disseminate its reports and studies and  
3 have its meetings more routinely and extensively  
4 covered consistent with our mandated requirement to be  
5 open and transparent."

6 That's my report. I'm sitting down now.

7 MR. LONG: Thanks, David. And now, I'd like  
8 to ask Greg Workman, who is chairman of the Finance  
9 Committee for the Council, to come up and give his  
10 report.

11 Greg?

12 MR. WORKMAN: Thank you, John. Thank you,  
13 Mr. Chairman.

14 My name is Greg Workman. I serve as the  
15 chairman of the Finance Committee of the National Coal  
16 Council. I will now report on the Finance Committee  
17 meeting that was held jointly by telephone conference  
18 call on May 7th with the Executive Committee.

19 At that meeting, the Finance Committee  
20 accepted the 2012 audit report from the Council's  
21 auditors, Chaconas & Wilson. Following the action of  
22 the Finance Committee, the Executive Committee also

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1 accepted that report. I'm very happy to report that  
2 the Council received a clean determination.

3 Also at this time, I'd like to publicly thank  
4 everybody for their dues -- 2013 dues -- submitting  
5 those. I do ask those who have not done so at this  
6 time to do so as soon as possible. The financial state  
7 of the Council continues to be stable but only because  
8 of the support of the membership and the generous  
9 timely giving.

10 Financial problems faced by many in this --  
11 in our country and indeed around the world continue to  
12 challenge that stability. If we all do our part, the  
13 Council will have the necessary financial resources to  
14 continue to effectively carry out our mission.

15 With that -- thank you, Mr. Chairman --  
16 concludes my report.

17 MR. LONG: Thanks, Greg. Do we need a  
18 motion, Janet, on the audit? We don't?

19 MR. PALMER: No, we do not.

20 MR. LONG: Okay. Okay. You know, I think  
21 you guys heard me say yesterday, we're certainly  
22 pleased to be able to entice Janet Gellici to join the

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1 National Coal Council after 30 years with American Coal  
2 Council. She's got some great ideas. It's clear she  
3 knows what she's doing by the success that we've seen  
4 at the American Coal Council.

5           So with that, I'd like for her just to make a  
6 few comments and kind of give everybody a perspective  
7 on where she's coming from. Janet?

8           MS. GELLICI: Thank you, John. I appreciate  
9 the opportunity to have the last word today. So about  
10 20 years ago, I was approached by Jim McAvoy. For  
11 those of you who've been with the Council, of course,  
12 you know that Jim was the first executive director of  
13 the National Coal Council.

14           And he approached me and asked if I would be  
15 interested in possibly apprenticing to serve as the  
16 next executive director of the National Coal Council.  
17 And this was back in the early '90s. And I had just  
18 taken over as executive director of the American Coal  
19 Council. I was living in Denver. I was happy there. I  
20 was settled. I was not really ready for primetime in  
21 Washington, D.C.

22           And so I graciously declined. I told Jim,

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1 "I'm just really not ready." I'm ready now.

2 I'm really ready now. I'm very, very, very  
3 excited about the opportunity to be up here and to  
4 serve you all. I was so very excited. My last day at  
5 the American Coal Council, after 30 years, as John  
6 said, was on May 15th. So Wednesday night, before the  
7 meeting started yesterday -- and I could barely sleep  
8 on Wednesday night.

9 And I had that same feeling, I remember, when  
10 I went to kindergarten. I just always wanted to go to  
11 school. I was just so excited. I was vibrating and I  
12 have that same feeling. So it was just really very,  
13 very exciting. I had my partner, David, take a picture  
14 of me and we're going to put, like, "Janet's first day  
15 at school," just a few years later.

16 So it's been very gratifying over the past  
17 few months and weeks to get letters and emails from  
18 folks, members of the Council and others in the coal  
19 industry in support of my taking over this position.  
20 And I really greatly appreciate that support. I know  
21 Bob Beck is not here but I did want to acknowledge and  
22 thank him for his stewardship of the council for the

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1 last 15 years while I've been getting ready.

2           And I did want to thank him as well for his  
3 assistance with the transition, also to thank Larry  
4 Grimes with his help and Pam Martin for their help with  
5 the transition and John Eaves. John and I have been  
6 meeting every three weeks or so for the last two or  
7 three months -- very patient. Appreciate it.

8           During the transition time, I think things  
9 can be very unsettling. You know, there's a lot of  
10 chaos. There's some uncertainty, a little bit of  
11 upheaval and folks not sure where things are going. I  
12 think it was Isaac Asimov who said, you know, "Life is  
13 pleasant. Death is peaceful. It's the transition  
14 that's really troublesome." So -- and I think that  
15 kind of about sums it up.

16           But I think we can look at transition in  
17 another way. I think we can look at it as an  
18 opportunity for reevaluation, a refreshing, a  
19 reassessment. And I think that's what we're going to  
20 be doing. And I know that's what we're going to be  
21 doing.

22           The National Coal Council Executive Committee

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1 has already been making plans. We've got a plan to  
2 plan, as it were, that we've been working on for the  
3 last two or three months. We're in the data gathering  
4 phase right now. In the middle of July, we will be  
5 hosting a strategic visioning session with a few of our  
6 top leaders to charter direction forward for the  
7 National Coal Council, which we hope will expand and  
8 enhance the activities of the National Coal Council  
9 going forward.

10           And I would like to ask for your help during  
11 this transition to take the opportunity afforded by  
12 this transition to provide us with your input. I'd  
13 welcome -- I'd actually encourage your input on what  
14 NCC can do, what we can do better going forward to  
15 achieve our objective, which ultimately is to provide  
16 advice and guidance to the Secretary of Energy.

17           And it's not just the National Coal Council  
18 that's going through a transition right now. I think  
19 it's an appropriate time for us to be undergoing a  
20 leadership transition in the midst of an industry  
21 that's also experiencing its own transitions and its  
22 own transformations. So we're kind of in step with

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1 that.

2           During these periods of transition, I think  
3 we have the greatest opportunity to kind of orchestrate  
4 our future. Gustav Mahler said, "The real art of  
5 conducting consists in the transitions." And if you  
6 think about that when you listen to a symphony, it's  
7 really the transitions that the conductor is leading us  
8 through.

9           And I think NCC has an opportunity to help  
10 shape and conduct the future of the coal industry. NCC  
11 can and should be, I think, the vision keepers for the  
12 coal industry going forward. We should be holding in  
13 place and envisioning that greatest, highest, best use  
14 for coal in our nation. And not just in our nation,  
15 but for the betterment of emerging nations worldwide. I  
16 think we have tremendous domestic resources that can  
17 fuel our economy. And we have an opportunity to help  
18 the world's emerging economies as well.

19           Each of you, as National Coal Council  
20 members, can contribute to defining that vision. I  
21 would encourage you again to use the NCC as an  
22 opportunity to serve as a catalyst to eliminate that

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1 path forward towards the future of our industry.  
2 Again, I invite you to join us in that effort, take  
3 advantage of this leadership transition to please  
4 recommit your energy, your time, your finances, to echo  
5 Greg's comments, towards the National Coal Council.

6           Go ahead and unleash your inner conductors.  
7 Help us orchestrate the future for the coal industry.  
8 We have a tremendous resource here with the National  
9 Coal Council and our opportunity to liaison with the  
10 Department of Energy. So I encourage you to join us  
11 and invite you and your support. And I thank you very  
12 much for your support and your confidence in me going  
13 forward.

14           Thank you.

15           MR. LONG: Thank you, Janet. I mean, we're  
16 so glad to have you. I think there's never been a more  
17 important time for us all to pull together. I mean,  
18 we're in a challenging environment but at the end of  
19 the day, coal will prevail.

20           The meeting today is duly authorized and  
21 publicized and is open to the public. The public can  
22 submit comments to the DOE or if any individual wishes

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1 to speak, they may do so at this meeting.

2 Is there anybody that wishes to speak at this  
3 time?

4 (No audible response.)

5 Hearing none, let me announce that we've planned to  
6 have the fall meeting here in Washington, D.C. Once we  
7 have a date and a time, we will announce that. Hearing  
8 no other business to come before the Council, I stand  
9 adjourned. Thank you.

10 (Whereupon, at 11:45 a.m., the National Coal  
11 Council Meeting was adjourned.)

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