

THE NATIONAL COAL COUNCIL
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2012 ANNUAL SPRING MEETING

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FRIDAY,
JUNE 22, 2012

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The National Coal Council met in
the Mount Vernon Room, 1177 15th Street, N.W.,
Washington, DC, at 9:00 a.m., C. Joseph Hopf,
Chair, presiding.

PRESENT:

C. JOSEPH HOPF, Chair
JOHN EAVES, Vice Chair
ALLEN B. ALEXANDER
SY ALI
CAROL J. BAILEY
RICHARD BAJURA
JANOS M. BEER
ROBERT A. BIBB

JACQUELINE F. BIRD
BILL BISSETT
STEVAN BOBB
ROBERT L. BRUBAKER
FRANK BURKE
MICHAEL D. CROTTY
KEVIN S. CRUTCHFIELD

STUART DALTON
GEORGE L. ELLIS
ALEX G. FASSBENDER
PAUL J. FELDMAN
ROBERT J. FINLEY
JOHN S. FISCHER
DAVID M. FLANNERY

MARK FRALEY
ROBERT D. GABBARD
PAUL GATZEMEIER

PRESENT(Cont'd):

JANET GELLICI
MANOJ K. GUHA
CLARK D. HARRISON
WILLIAM HOBACK
MARTY IRWIN
CHRISTOPHER P. JENKINS
NORMAN KETTENBAUER
KLAUS LAMBECK
JOHN T. LONG
RICHARD P. LOPRIORE
CHARLES MCCONNELL, Assistant Secretary for
Fossil Energy, U.S. DOE
STEVE MELZER
JANINE MIGDEN-OSTRANDER
JEFFREY MILLER
RAFIC Y. MINKARA
MICHAEL G. MUELLER
RAM G. NARULA
KENNETH J. NEMETH
DONALD NEWELL
JERRY J. OLIVER
ROLAND OTTE
FREDERICK D. PALMER
ROBERT M. PURGERT
MASOOD RAMEZAN
FREDERICK M. REUTER, III

MARK SCHOENFIELD
DANIEL D. SMITH
WILLIAM J. SPENGEL
DAVID F. SURBER
DANIEL THOMPSON
JOHN W. THOMPSON
DAVID D. TURNBULL

RAJA P. UPADHYAY
DAMAN WALIA
JEFFREY L. WALLACE
GREGORY A. WORKMAN
NCC STAFF PRESENT:
ROBERT A. BECK

LARRY B. GRIMES
PAMELA A. MARTIN

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

2 (9:09 a.m.)

3 CHAIR HOPF: Good morning, ladies
4 and gentlemen. My name is Joe Hopf and I am
5 the Chairman of the National Coal Council.
6 The spring meeting of the National Coal
7 Council, I'm going to hereby call to order.

8 This morning we are fortunate to
9 have a number of very special guests. We are
10 pleased to welcome this morning Assistant
11 Secretary of Fossil, the Honorable Charles
12 McConnell.

13 Many of you know Chuck from his
14 many years working in the energy sector and it
15 his true privilege to have him here to speak
16 to the Council for the first time since his
17 confirmation as assistant secretary. Chuck,
18 it's a pleasure to have you with us today.

19 We also have another -- some other
20 exceptional speakers today. They are Steve
21 Melzer, one of the leading experts on enhanced
22 oil recovery application. Also, Steve is one

1 of the lead authors on our new council study
2 that we will take action on shortly, later
3 this morning. Welcome Steve, and thank you
4 for all the work you put in on the study and
5 we look forward to seeing your presentation.

6 Also we have today is Daman Walia.
7 Daman has been a leader in the developing
8 biotechnologies to clean coal before it is
9 burned. Many of you are familiar with his
10 work and we look forward to his update and
11 presentation.

12 I'm also pleased to recognize
13 Robert Wright of the DOE's Office of Fossil
14 Energy as the federally-designated
15 representative. I'm not sure if -- yes, there
16 he is back there. Okay. Welcome, Bob. Good
17 to have you here today.

18 In addition to the speakers, we
19 also must conduct the regular business of the
20 Council. This morning that includes reviewing
21 action on the new study that was requested by
22 Secretary Chu back in October 28th of 2011, as

1 well as the election of officers for the new
2 two-year term of the Council.

3 So, as you can see, we have a very
4 full agenda. This meeting is being held in
5 accordance with the Federal Advisory Committee
6 Act, and the regulations that govern that Act.

7 Our meeting is open to the public.
8 I would like to welcome guests from the public
9 who have joined us today. An opportunity will
10 be provided at the end of the meeting for them
11 to make comments if they so choose.

12 Full and complete minutes of this
13 meeting are being made as well as a verbatim
14 transcript. Therefore, it is important that,
15 when you have a question, you use the
16 microphone when you wish to speak, and that
17 you begin by stating your name and your
18 affiliation.

19 Council members have been provided
20 a copy of the agenda for today's meeting. If
21 would appreciate having a motion for the
22 adoption of the agenda.

1 Second? All in favor?

2 (Chorus of ayes.)

3 CHAIR HOPF: Opposed?

4 (No response.)

5 CHAIR HOPF: Okay. Thank you.

6 Next I would like to announce that the
7 Secretary has appointed several new members to
8 the Council. I will introduce them and if they
9 are present, I would ask them to stand as they
10 are announced.

11 Bill Bissett from Kentucky Coal
12 Association. Robert Finley from the Illinois
13 State Geological Survey. Julio Friedman from
14 Lawrence Livermore National Lab.

15 Mary Eileen O'Keefe, Lakeshore
16 International. Daniel Thompson from Dynegey.
17 John Thompson, Clean Air Task Force. Justin
18 Zachary, and he has a representative, Desmond
19 Chan, from Bechtel. Welcome to all the new
20 members.

21 (Applause.)

22 CHAIR HOPF: So at this time, I

1 would like to move forward and introduce the
2 Honorable Charles McConnell. He is Assistant
3 Secretary for Fossil Energy with
4 responsibilities for office operations and
5 managing the oversight of Fossil Energy's
6 Research and Development program, encompassing
7 coal, oil and natural gas, and the U.S.
8 Petroleum Reserves.

9 Prior to joining the DOE, Mr.
10 McConnell served as Vice President of Carbon
11 Management at Battelle Energy Technology. He
12 also served 31 years with Praxair in various
13 positions in the U.S. and Asia, including
14 Global Vice President.

15 Mr. McConnell has held a number of
16 advisory positions, including chairmanships of
17 the Gasification Technologies Council and the
18 Clean Coal Technology Foundation of Texas.

19 Please join me in welcoming the
20 Honorable Charles McConnell.

21 (Applause.)

22 MR. McCONNELL: There we go, thank

1 you. Let's see how this works. Glad to be
2 here. I wore my black suit today. It's
3 actually made of coal.

4 (Laughter.)

5 MR. McCONNELL: When I took this
6 job a year ago, I went in to see Secretary Chu
7 and I want to share this story with you,
8 because I think this group will appreciate it,
9 at least I hope so.

10 I said, "What do you want me for?
11 Everybody knows you hate coal." And he had a
12 big smile on his face. He goes, "I don't
13 really hate coal."

14 I said, "Well, boy, I'll tell you
15 what, that's an interesting comment because a
16 lot of people do sure think you do. And
17 really, for you to be looking for somebody --
18 I really want to understand where you are."

19 And we had a, probably one of the
20 better two-hour conversations I've ever had.
21 Obviously, I didn't get into a whole lot of
22 technology because the guy's a Nobel Prize

1 winner, and I've been selling industrial gas
2 for 32 years.

3 But we talked about business
4 philosophies and where are we going? We've
5 got 10 -- at the time 10 demonstration
6 projects active in the portfolio and he said
7 to me, "So what do you think? How many of
8 these projects are going to make it?"

9 And so we had a really, really
10 good debate. But at the end of that, I told
11 him, "There's one thing for sure that we need
12 to address, and that is, a lot of what's been
13 going on up to now, has been predicated on a
14 climate change mentality in this country, from
15 this administration, that from my perspective
16 doesn't have a really good potential future
17 over the next several years, and I don't want
18 to take control of an organization's destiny
19 based on what I think is a flawed foundation.

20 "And so I'm going to ask that we
21 start to think about this whole coal power,
22 coal utilization, fossil utilization with a

1 business mind set, because we are going to
2 have to. We can't do it based on a climate
3 change bill that I don't think is going to
4 pass and heart of hearts, I'm not sure you do
5 either."

6 And I won't tell you what his
7 reaction is, but that's what my concern was
8 coming into this job.

9 So I'm going to spend a little bit
10 of time with you today, talking about what,
11 over the past year, we have been working very
12 hard at in fossil energy, and in this town,
13 which has been another education for me
14 personally, to try to get the aircraft carrier
15 moved in a different direction, to a direction
16 I believe that has a future. It's a future
17 not just for political purposes, but for the
18 industries that you represent and a broader
19 base of industries, some of which even aren't
20 in this room, but ultimately, all in, in terms
21 of fossil.

22 So flash back for yourself to

1 2009, and this is what the realities of the
2 world were, just in a short cartoon. Carbon
3 legislation was right around the corner, or at
4 least it was a 50-50 bet it was, or at least
5 it was something that industry was willing,
6 for the first movers, to want to grab a hold
7 of a 50-50 cost share with the Department of
8 Energy, to go forward on technology
9 development, because that was the smart thing
10 to do.

11 Oil was about 50 bucks a barrel.
12 Natural gas prices were pretty high. And the
13 cost of CO2 capture, everybody knew was high
14 and needed to come down, and that was kind of
15 the reality of where we were.

16 So now, let's flash forward for
17 three years. We don't have any carbon
18 legislation. If I was going to bet you, do
19 you think it's going to come in the next two
20 or three years, I don't think so.

21 Oil is 100 bucks a barrel. It's a
22 whole different ball game. And natural gas is

1 low, low price, and likely to be low cost for
2 quite some time because the shale revolution
3 is upon us in a big way, and the only thing
4 that's the same is the cost of carbon capture
5 is still too high.

6 That's really sort of the
7 comparison and contrast, and that says that
8 from a business standpoint, anybody running a
9 business, you've got to pay attention to the
10 external environment. You've got to see where
11 you're going. You can't just simply hang on
12 to what you have been doing and try to keep
13 pounding the rock. You have to keep your eye
14 up and your finger in the wind.

15 So, we need to move on and the way
16 to move on, I believe, is through enhanced oil
17 recovery, as a means of introducing you to
18 what had previously been discussed as CCS.

19 Everybody knew what CCS was. We
20 had spent 10 years working very hard, learned
21 an awful lot, demonstration projects, best
22 practices, protocols, technology development,

1 R&D in CO2 capture, go down the list. It's
2 all good. It's all for good purpose.

3 But the fact of the matter is, the
4 purpose to chase climate change legislation
5 and try to impact the levelized cost of
6 electricity, I'm here to tell you today, I
7 believe, is an anachronism.

8 And what we need to chase is a
9 business driver, a business goal, in the
10 marketplace, that's alive today. Enhanced oil
11 recovery is being practiced across the
12 country.

13 Now, most of the enhanced oil
14 recovery across the country is being done by
15 naturally occurring CO2, naturally occurring
16 wells and sources.

17 But there are places in this
18 country where CO2 from anthropogenic CO2
19 sources, with no government subsidies, is
20 being practiced today.

21 EOR has increased 40 percent over
22 the past six years. In 2010 it was five

1 percent of domestic overall production, but if
2 you look at those curves, and you look at
3 where EOR has gone, and where it's going, I'm
4 here to tell you there's two things that are
5 going on in the marketplace.

6 Number one, for EOR to continue to
7 grow in this country, the naturally occurring
8 sources are tapped out, and for growth to
9 occur, anthropogenic CO2 needs to come into
10 the game.

11 And the other fact is CO2 from
12 anthropogenic sources is being practiced, EOR
13 is being practiced today, with no government
14 subsidies, so you don't need to have CO2 at
15 \$10 a ton for something to be realizable,
16 because it's being done today.

17 \$100 a barrel oil has changed the
18 game. Now, albeit, there are places in the
19 country where infrastructure is bought and
20 paid for already. Pipelines are in place,
21 fields are developed. It's incremental.

22 I've run pipeline businesses

1 before, and you are a genius when you are the
2 guy that takes over the business after
3 somebody else put the infrastructure in. It's
4 a great place to be, man. For two years, I
5 was just counting the money. It was the
6 greatest job I ever had in terms of
7 performance.

8 And the most challenging jobs I
9 ever had were the ones where we didn't have
10 the pipes. The customers were right there.
11 We knew they were there. But we had to get
12 over the hurdle.

13 And that's largely what we are
14 talking about in this business right now,
15 because the oil is out there. There's a lot
16 of it.

17 And for anthropogenic CO2 to get
18 into the marketplace, there's plenty of oil,
19 there's plenty of opportunity, and there's a
20 future that is different than we looked at
21 three years ago.

22 We just came out with the NATCARB

1 Atlas. You may be very familiar with it.
2 What I would also add to that slide before, in
3 2009 is, if you'd have asked me how impactful
4 enhanced oil recovery would be in terms of
5 geological regimes to sequester CO2, I would
6 have said, with no reservation, "It's just a
7 niche. There's just a little bit of that
8 geology, and really, EOR is nothing more than
9 a short-term pathway to enable CCS technology
10 to ultimately come into play," because of
11 course we all knew carbon legislation was
12 coming.

13 I would suggest to you, if you
14 look through the NATCARB results that recently
15 came out, and what we have understood now in
16 terms of oil-bearing regimes that are proven,
17 and then the other regimes, such as the ROZ in
18 West Texas and other places that you are
19 probably all very familiar with, the potential
20 for it is enormous.

21 It's not a niche. It's enormous,
22 enormous like 50 to 100 years' worth of

1 geological storage capacity for the fossil
2 industry.

3 This is oil-bearing regimes in
4 places where we can go and make money doing
5 it, not chasing climate legislation.

6 I'd suggest, if you're not
7 familiar with the recent NATCARB publications,
8 you ought to do it, because the other thing
9 about that region in the center, with all
10 those red zones, if you take a look at those
11 zones and you start laying on top of that
12 where wall the CO2 from coal-fired power
13 plants, and ultimately natural gas-fired power
14 plants are, it lays down on top of each other.

15 And so people talking about
16 running thousand-mile pipelines to dispose of
17 CO2 in some strange location far away, that's
18 just not sensible from a business standpoint,
19 never was when it was conceived.

20 We've got oil near where the CO2
21 is. We have to have pipelines. We have to
22 have the fields developed. But this is a

1 business. And we start looking at it as a
2 business concept, the factors and the forces
3 are in place.

4 So this is what I have been
5 trotting around town with. You need a catchy
6 term in this town. I've found that out. So
7 we are calling it the unmined gold story in
8 America.

9 Anybody in this room know where
10 the Saudi Arabia of the world for oil was in
11 1925? Ohio, yes, specifically the home of Ben
12 Roethlisberger. Findlay, Ohio, right? Yes.

13 Here's another fact. Ninety
14 percent of the oil that was found in Ohio back
15 in 1925 is still in the ground. And the
16 people that did the oil exploration, less
17 their hearts, as we like to say in Texas, in
18 1925, were fundamentally doing it with
19 medieval technology, doing the best they
20 could, and then they moved on to the next
21 place where there was natural pressure.

22 But there is a gob of oil still

1 under ground, and but for the availability of
2 inexpensive, quality CO2 that can easily come
3 from anthropogenic sources that are up and
4 down the Ohio river valley, in Michigan,
5 places like that, it is the unmined gold
6 story.

7 And I'm here to also tell you that
8 although many of you may say that this
9 administration has declared war on coal, I'm
10 not going to debate semantics with you. But
11 what I will tell you is, over the past several
12 months, people are very interested in this
13 story that we have brought forward from fossil
14 energy, courtesy of the NATL studies, courtesy
15 of the work that folks like you have done in
16 terms of building up a business case. That's
17 what we needed and that's what we've got.

18 We've got a lot of oil in the
19 ground. We've got an energy security story.
20 We've got a domestic, economic story to tell
21 in terms of the oil it could produce, we've
22 got jobs creation and oh, by the way, every

1 ton of CO2 that goes into EOR eventually will
2 get permanently and safely stored.

3 So you don't have to make a choice
4 between good economics and good climate
5 change. You get both.

6 You are very familiar, I'm sure,
7 across the country, with the regional
8 partnerships, a lot of the work that has gone
9 on. Let me just make a couple of comments,
10 rather than going over the chart in detail.

11 First and foremost, if you look at
12 the regions where the oil is, and you look at
13 where the partnerships are set up and where
14 the point sources of CO2 are, they lay down
15 quite well.

16 Second thing I'll tell you is, up
17 to now, the partnerships have spent an
18 enormous amount of time working on saline
19 aquifer CO2 disposition.

20 And although it was all good work
21 for good purpose, generated good best
22 practices, et cetera et cetera, I just spent

1 the last two months beating my brains out with
2 OMB and have gotten to the point now where we
3 are redirecting funds in the partnership and
4 we are going to go after EOR geologies.

5 We are not going to be required to
6 focus on saline aquifers. We are not going to
7 be required to pursue it only as a climate
8 change mitigation strategy. But the stuff I
9 just showed you is now becoming very acutely
10 aware, around this town, of what the potential
11 for this can be.

12 So the partnership work will
13 continue. Saline aquifer will not cease. But
14 what I will tell you is the 80-20 of what we
15 are going to be looking at is EOR, because we
16 must.

17 So you are all familiar with what
18 the demonstrations are. I don't need to --
19 this is a little bit more difficult than I
20 wish it were. There we go.

21 So I don't need to go through the
22 animation walkthrough. But it's interesting,

1 if you look at where the demonstration
2 projects are in the portfolio, and where the
3 focus in terms of the polygeneration
4 capabilities of these facilities, they are
5 near CO2 pipelines. They are near where the
6 oil is. It's a revenue stream that adds on to
7 the project that's not just nice to have. I'm
8 here to tell you, it's essential.

9 If you are going to spend extra
10 money on the back end of a project and you're
11 not going to get a revenue stream for it,
12 there's no way anybody's going to do it.

13 But in these cases, you've got
14 infrastructure that is bought and paid for,
15 you've got oilfields that are already
16 developed, and you've got an opportunity at
17 \$100 a barrel oil and forward pricing on oil
18 where you can afford to make the investment
19 for CO2 EOR.

20 It's no surprise that all the
21 projects that we have in our portfolio that
22 are still healthy and are moving forward

1 strong, by and large, are driven by that
2 revenue stream for EOR.

3 So what do we need? What's the
4 big elephant in the room? The elephant in the
5 room is carbon capture technology. We've got
6 the National Carbon Capture Center in
7 Wilsonville. We've got a lot of work that has
8 been going on in fossil as well as RPE and in
9 science.

10 But let me be real candid with
11 you. We have got ideas and we have got
12 teacups full of pixie dust sitting around in
13 places that are not ready for commercial
14 deployment.

15 So I get concerned about how fast
16 can we get there, and how much of an
17 investment, is industry continued to be
18 enthused about, and what I'll tell you is it
19 can't be a reluctant enthusiasm.

20 It needs to see the prize.
21 Industry, overall, collectively. I'm not
22 talking about just you in this room, but I'm

1 talking about the fossil industry and
2 marketplace in general, the oil and gas
3 community as well.

4 There's an enormous amount of
5 potential out there but the carbon capture
6 technologies that you are all very familiar
7 with, the crosscutting R&D and the advanced
8 systems that you are all familiar with, let me
9 tell you what, the fossil budget right now is
10 not enormous. It's been receiving a haircut
11 routinely over the past several years. And we
12 are working very hard to restore some of the
13 pieces of that budget for research going
14 forward.

15 But here's what I really know for
16 sure. It isn't about another 10 or 20 or 30
17 million dollars in the fossil budget. That
18 doesn't make that big of a difference.

19 The difference is made in this
20 room by the people in industry that see what
21 they want to go after. And when that starts
22 to come to fruition, and the enthusiasm behind

1 that and the push behind that is, I'm not
2 doing this because I'm reluctantly concerned
3 about carbon legislation, I'm doing it because
4 I want to make a creative investment for my
5 shareholders over the next five years, and as
6 soon as I can get there, the better, and this
7 is what we need to address.

8 We need the industry's head in the
9 game to get this change. And here's the other
10 thing I believe I know for sure, is you are
11 not going to shame the Chinese into doing
12 this. They are going to do it for one reason
13 -- because they believe it's in their own best
14 self-interest.

15 They are ready to invest in the
16 projects that we have in our portfolio over in
17 this country because they don't know how to do
18 EOR.

19 They are working on some of this,
20 but in terms of what they have got in China,
21 they are not going to spend any time putting
22 CO2 in saline aquifers. I can tell you that

1 right now.

2 But they are going to go after
3 enhanced oil recovery and they are going to
4 come over here and learn, and I told them,
5 "Come over and learn. We are happy to have
6 you. Don't forget to bring your money,
7 because we want you investing. We don't want
8 you observing and we will be happy to do
9 cooperative investment with you as well."

10 And there's a lot of cooperative
11 investment opportunities going on in China as
12 well, and I'm not suggesting we are going to
13 have one big happy family, that we are going
14 to partner on this thing together into the
15 future. But what I'm suggesting to you is
16 that's where the global story is.

17 So when people say EOR is only in
18 the United States, that's true -- today. But
19 there's a tremendous amount of oil around the
20 world that everyone else is waking up to as
21 well. The whole key is getting the cost of
22 carbon capture to where it needs to be.

1 So what are we going to do? We
2 need to get the demonstration projects that we
3 have in our portfolio built, on time, on
4 budget.

5 We need to get them started up.
6 We need to run them for three years. And we
7 need to get the operational background that
8 comes from that.

9 There is no substitute for
10 building these beasts the first time, because
11 it's an enormously difficult task. And once
12 we do, we can't be satisfied that we have
13 solved the problem, because we haven't.

14 What we have done is taken a big
15 step to getting the money deployed, to get the
16 plants built, to gather the learning. But the
17 other thing we know for sure is I hope that
18 carbon capture technology is obsolete within
19 the next 5 to 10 years, absolutely obsolete,
20 way, way more expensive than what is coming in
21 the pipeline between now and 2020 and 2025,
22 with second generation and third generation

1 technology evolution that is going to drive
2 the cost of carbon capture to what it is
3 today, 80, 100 bucks a ton, in a good
4 situation, down to something that the
5 marketplace is going to be able to broadly
6 adapt across the board, between 30 and 40
7 dollars a ton.

8 That's a big step change, but it's
9 possible and we see the potential for it. And
10 so we have got to move through this timeline,
11 but I'm here to tell you it's not just about
12 FE's budget.

13 If I believed it was that critical
14 for an extra 10 or 20 million dollars one way
15 or the other, I would -- I would be delighted
16 to know that it was just that simple, but it
17 isn't.

18 It's investment. It's your
19 investment in the ideas. It's your investment
20 in things like the National Carbon Capture
21 Center with demonstrations and opportunities
22 to bring technology to commercial deployment.

1 We need to get these things out of teacup
2 sizes into commercial demonstrations, and I'm
3 here -- I'm also here to tell you that I
4 believe that next wave of demonstrations is
5 very likely going to be near pipelines where
6 the CO2 is used for EOR today, not by going
7 out in the middle of some corn field in some
8 strange place across the country just to
9 demonstrate capture technology and put it in
10 a saline aquifer.

11 That is an old story and the new
12 story is we've got to lay this stuff down
13 where the pipelines are, so we can make an
14 impact.

15 And that's where the next wave of
16 demonstration projects are going to be, and
17 it's not going to be through a stimulus bill
18 with \$3.2 billion.

19 It's going to be sensible
20 investment on the back end of a lot of these
21 facilities that we can do for \$100 million or
22 a couple of hundred million, because we have

1 to. It has to be business. It has to be
2 sensible.

3 So, you've got to make a choice.
4 People ask you to make the choice. Do you
5 want to be environmentally friendly or do you
6 want to have it economically sensible?

7 And I won't answer the question.
8 I tell people that's a bad question, because
9 if you've got technology and you've got the
10 capability, you don't have to answer the
11 question to get both. It's the power of and,
12 not or.

13 So this is my favorite slide when
14 I talk to groups like this. What do you see?
15 What do you see in that picture? Life itself.
16 That's a good answer.

17 A lot of people say dirty coal
18 miners, okay? You know what I see? I see
19 Little League coaches. I see guys that are
20 involved teaching at the church. I see people
21 that are in the community, maybe even PTA
22 leaders, right? Life itself.

1 It is life itself. I grew up in
2 eastern Ohio. I used to get stuck behind coal
3 trucks all the time, okay? And I used to
4 complain about them.

5 But I learned as I grew up, that's
6 not something to complain about. That is life
7 itself. Right? That's where there were two
8 cars in the driveway in most of the town where
9 I grew up, in Steubenville, okay?

10 And those jobs and those guys are
11 still there, but I'm going to tell you
12 something else, sustainability is all driven
13 by technology.

14 We have got a real challenge in
15 front of us and it's about keeping coal and
16 natural gas, but especially coal, in fossil,
17 a compelling choice.

18 And that means it's still the best
19 value out there in terms of energy production
20 or in terms of chemicals production, but it's
21 also sustainable from an environmental
22 standpoint.

1 So technology is a key. It is
2 about jobs. It's about revenues, not just
3 government revenues at the state level, but
4 even as far down as school taxes in the local
5 community in which these people work.

6 It's GDP growth. It's
7 environmental sustainability. I believe that
8 coal can continue to be a compelling choice.
9 I believe organizations like this and the work
10 that we are doing can make it that way.

11 But I also believe that the way to
12 get there is technology evolution because, as
13 much as we could complain about the EPA, and
14 I get frustrated too, but at the end of the
15 day there is a lot of inevitability that is in
16 front of us, that if we had the technology to
17 solve it, we wouldn't be whining and moaning
18 about it, we'd be getting after it.

19 And I believe that's the challenge
20 now, is to move into that kind of regime, look
21 at the business opportunity and go after it.

22 So I can take some questions now. Thanks.

1 (Applause.)

2 MR. BECK: Thank you, Chuck. Just
3 to make a comment on the statement. The
4 Findlay college team that we used to play when
5 I was at Thomas Moore College in Kentucky
6 playing basketball, their nickname is the
7 Oilers. So there is a longstanding tradition
8 back there and they used to have a Godawful
9 green basketball floor. It was terrible.

10 Anyway, Chuck is willing to answer
11 a few questions, and at this time that would
12 be from the members of the National Coal
13 Council only. He is going to step outside in
14 a little bit and talk to the media.

15 So I would ask the media to hold
16 and you can go ambush him outside. Questions,
17 comments, from members of the Council? And
18 again, for the purpose of the record, please
19 state your name and affiliation.

20 MR. McCONNELL: I would encourage
21 you to be as provocative as you'd like to be,
22 and if I can't answer, I'll just tell you.

1 MR. NARULA: Mr. Secretary --
2 Assistant Secretary, congratulations for the
3 very inspiring talk you gave. I just wanted
4 to seek clarification on your point about
5 every ton of CO2 injected, eventually it will
6 be all sequestered.

7 Now, in EOR, the first time
8 around, 50 percent comes back and then it gets
9 reinjected and the process continues. Is that
10 what you meant, everything captured eventually
11 gets sequestered?

12 MR. McCONNELL: There is
13 recycling. It's a big part of the industry.
14 But here's the other thing with people, it's
15 interesting. Environment people get really
16 concerned when you start talking about the oil
17 and gas industry doing CO2 management because
18 their natural reaction is, well, this isn't --
19 this is a part of an organization's, perhaps,
20 that we are, you know, we are not as close to,
21 we don't really understand.

22 And my comment back is, CO2 is the

1 biggest part of the cost stack for people to
2 do enhanced oil recovery. So, sure they want
3 to measure it and monitor it and verify it.
4 Sure they want to get use out of every single
5 ton.

6 They don't want to be venting it.
7 They don't want to be wasting it. They want it
8 to go into that formation, because for every
9 ton that goes in, I get two to three barrels
10 of oil that comes out. So I don't want to
11 vent the CO2 and pay somebody for it. I want
12 to put technology in place to maximize my
13 investment.

14 So in my mind, again, this isn't
15 something you are laying on top of an industry
16 to try to make them behave better. What you
17 are doing is you are incentivizing business to
18 do the things that they do best, and that's
19 take advantage of raw materials, products and
20 resources that all of you know. That's how
21 you manage your balance sheet and that's how
22 you make money, and I believe this is an

1 opportunity for us to make money.

2 MR. BECK: For the purpose of the
3 record, that was Ram Narula that asked the
4 question. Sy.

5 MR. ALI: Sy Ali, with Clean
6 Energy Consulting. What are your views in
7 terms of using CO2 for other purposes besides
8 EOR?

9 MR. McCONNELL: The question was
10 what are the views regarding CO2 for other
11 purposes besides EOR. It's a great question.
12 And the answer lies in how fast can we drive
13 the cost of carbon capture and CO2 capture
14 down to whatever levels that we look at for
15 biofuels, algae, this, that and the other
16 thing, okay?

17 What I do believe is that in any
18 business plan, you've got to understand what
19 you are going to do first, and then move on to
20 next and next and next.

21 And I think what we are talking
22 about today, focusing on the here and now, is

1 we've got an opportunity with EOR that is
2 going to catalyze industry to move forward.
3 We are going to be able to drive down the cost
4 of CO2 capture.

5 And I think the answer to your
6 question is five years from now, 10 years from
7 now, we are going to be using CO2 in a lot of
8 different ways.

9 I will say, spent time last year
10 in China, with ZhenHua, and ZhenHua's strategy
11 is all about CO2 utilization, not just
12 exclusively for EOR, but they make chemicals,
13 they are involved with all kinds of things in
14 the value chain, and everybody's aspirations
15 are there's no point in reforming natural gas
16 to make CO2 or other situations, why not be
17 able to utilize it from the coal processes
18 that we have?

19 So I think that's a natural
20 evolution and your question is probably a
21 little bit ahead of its time in terms of other
22 things before EOR, but it's right around the

1 corner, I hope.

2 MR. BECK: Anyone? One more. I
3 know Chuck's on kind of a tight schedule this
4 morning, and I guess eventually -- I've known
5 Chuck for probably over 20 years -- I guess
6 I'll get used to calling him the Honorable one
7 of these days.

8 MR. McCONNELL: But I won't get
9 used to it Bob, yes.

10 MR. BECK: All righty. We
11 appreciate it very much, and please join me in
12 thanking the Assistant Secretary.

13 (Applause.)

14 CHAIR HOPF: As Bob said, thank
15 you Chuck for your time. I know you have a
16 busy schedule but it was a great discussion.
17 At this time I'd like to introduce Fred
18 Palmer. He's our chairman of our -- of the
19 Council's coal policy committee and he is
20 going to kick off the discussion and introduce
21 the folks that will give the presentation on
22 our study and its findings and

1 recommendations. So I'll turn it over to Fred
2 Palmer.

3 MR. PALMER: Thank you very much
4 and good morning. It's an honor and a
5 pleasure and a privilege for me to stand in
6 front of you today as chair of the coal policy
7 committee for the NCC to ask for your
8 consideration and adoption of this extremely
9 important study that we have done.

10 The Assistant Secretary is leaving
11 and I want to thank Chuck very much for his
12 counsel and support in doing this. I think we
13 have a study that is extremely consistent with
14 what you have put on the board here, and
15 actually ramps up a little form there.

16 So we are joined at the hip and we
17 hear what we say and we will follow through.
18 Thanks Chuck.

19 (Applause.)

20 MR. PALMER: Coal's competitive
21 advantage is its carbon content. The --
22 insofar as enhanced oil recovery is concerned

1 you cannot do an at-scale without coal, and
2 there are tens of billions of tons of
3 economically recoverable barrels of oil that
4 we have in the United States that is available
5 to us by furthering the technology path that
6 the Assistant Secretary has identified in a
7 robust way, at scale.

8 The title of the study is
9 Harnessing Coal's Carbon Content to Advance
10 the Economy, Environment and Energy Security.
11 Coal's carbon content is its competitive
12 advantage.

13 No other fossil fuel in the United
14 States can be utilized the way coal can be
15 utilized to recover the oil treasure that we
16 have.

17 And when you combine the potential
18 for EOR at some four million barrels per day,
19 three and a half to four million barrels per
20 day, plus putting in a coal-to-liquids fleet
21 at the same time, we can get coal to liquids,
22 essentially up to six to seven million barrels

1 per day in the United States.

2 This is a decadal-long stretch
3 long, what we call an aspirational goal. But
4 it is very real. And it is also economical in
5 today's market environment.

6 The study that we have is
7 responsive to the Secretary, Secretary Chu's
8 letter. We are very fortunate to have had
9 Dick Bajura chair this study.

10 I want to thank, in advance of
11 Dick's presentation this morning, the very
12 very hard work and diligent work that he did
13 in advancing this, the people that
14 participated, many of whom are in the room and
15 in drafting the chapters that were -- became
16 a part of the study.

17 And also a tip to the hat once
18 again, to Frank Clemente who is sitting in the
19 back, as essentially our managing editor in
20 this process.

21 Frank has been involved with the
22 National Coal Council in the study process

1 since March of 2006, when Greg Boyce's study
2 "Coal: America's Energy Future" was released
3 and has been with us over the six full years
4 in the numerous studies that have come out at
5 that time.

6 He has had hands-on involvement in
7 every one of them, including Texas Utilities -
8 -- not Texas Utilities anymore -- but the TU
9 study that was done I believe back in 2007.

10 So a tip to the hat to Frank and a
11 round of applause for his assiduous work.

12 (Applause.)

13 MR. PALMER: With that, let me
14 introduce Dick Bajura, and again, my
15 congratulations to Dick for the work that he
16 has done in presenting this.

17 After Dick will take us through
18 the -- what he study provides, after Dick is
19 done I am going to return and I will move the
20 adoption by the full Council of the study,
21 following a second we will have opportunity
22 for discussion, a call for question and

1 hopefully we get this accepted by the full
2 Council today. I hope we do. We have a draft
3 press release ready to go on it. So that
4 cannot be released until we do.

5 But in any event, Dick, would you
6 come up now and take this over for a while?
7 Thanks.

8 MR. BAJURA: Thank you, Fred and
9 good morning, everybody. Mr. Chairman, we are
10 pleased to work with you to present the
11 results of our study.

12 My presentation will follow the
13 outline shown above, summarizing the
14 objectives of our study, a few comments about
15 how we were organized, discussion of our
16 findings and recommendations, and then the
17 overall discussion that Chairman Palmer
18 described.

19 Secretary Chu asked us to conduct
20 a new study focusing on capturing carbon
21 dioxide from fossil fuels, also asked us to
22 examine opportunities for fuels in chemicals

1 from coal, and substitute natural gas using
2 the captured CO2 for enhanced oil recovery,
3 non-traditional uses of coal, and finally a
4 discussion of the economic and security
5 benefits from enhanced oil recovery
6 technologies.

7 Our administrative group consisted
8 of myself as the study chair. Fred Palmer
9 described the excellent work that Frank
10 Clemente has provided in being our technical
11 work group chair or report manager, if you
12 will.

13 Fred Palmer, as usual, has offered
14 guidance to us and to previous groups, and I
15 thank Bob and Larry, who are the people who
16 help make the Council work day by day, for
17 their input and advice during this study.

18 Our report was organized along a
19 thematic approach that you will see in the way
20 we have organized the chapters. Frank and I
21 worked with everybody to help put together our
22 executive summary.

1 We illustrated our report by
2 describing the overall scenario that we are
3 under. Frank Clemente took the job of writing
4 that chapter.

5 Roger Bezdek undertook the task of
6 describing the economic and energy stimuli
7 that would result from deploying these
8 technologies, and I thank Roger for
9 undertaking some new work in putting this
10 chapter together.

11 Our third chapter addressed the
12 issue of carbon capture technology, focusing
13 here on what happens inside the plant, if you
14 will. That was ably led by Holly Krupke, who
15 also worked with us on last year's report.

16 We then had two chapters
17 addressing the issues of EOR technology, the
18 first one led by Steve Melzer, who addressed
19 the issues related to what is EOR technology.

20 And then the second part,
21 addressed by Jerry Oliver, who asked the
22 question, "How do we integrate what goes on

1 inside the plant with what goes on out in the
2 field?"

3 The sixth chapter was one that was
4 devoted to other aspects of synfuels
5 technology. That was led by Bob Williams, who
6 also contributed a lot of new information to
7 the study.

8 And the last chapter was led by Sy
9 Ali, who addressed issues related to other use
10 is for CO2.

11 Our activity schedule was as
12 follows. The last part of last year we spent
13 working with DOE to make sure we understood
14 what they wanted in this study.

15 The early part of this year we
16 formed our team and we spent three months
17 working as a collective group on this study,
18 which took us to June of this year, where we
19 made a presentation of this report to the Coal
20 Policy Council and are now presenting the
21 results to you.

22 We had over 60 team members

1 working with us in one way or another on this
2 study. We had at least 15 full team
3 teleconferences, numerous discussions amongst
4 our study groups, and I really want to thank
5 the study group for the work they did in
6 interacting with each other.

7 And then we made the presentation
8 to the Coal Policy Committee in Chicago on
9 June 7th. Today's objectives, I will review
10 with you briefly the approach that we took in
11 structuring the report, describe the findings
12 and recommendations, and then seek your
13 guidance, as Fred described earlier.

14 Our rationale consisted of working
15 as the Council usually does to obtain our
16 information from studies that are out there in
17 the literature so that we can cite credible
18 sources.

19 As described earlier, we have
20 conducted some original studies for this
21 report. We have posited an aspirational case
22 that Fred described briefly. This is one

1 where we are asking the question, what could
2 be in terms of the opportunities for EOR, what
3 could be if we did what we could with carbon
4 capture, and put together a scenario that was
5 a stretch, but is one that we believe is
6 achievable.

7 The other thing that we did in our
8 study was to examine the ways that one chapter
9 interacted with another, one theme interacted
10 with another, to ensure that as we went
11 forward with our report, the chapters were all
12 consistent, we were studying the same problem
13 and were making reports on topics that were
14 integrated together so that we had a
15 consistent story.

16 Our findings are listed in the
17 executive summary. You have a copy of that
18 summary in your packet. I will describe them
19 briefly.

20 The work that we did, and thanks
21 to Roger Bezdek, showed that we could expect
22 something like \$2 billion in sales annually by

1 deploying these technologies. One million
2 jobs would be created, and state, local and
3 federal taxes would amount to \$60 billion.

4 The deployment of CCUS EOR
5 technologies can expand domestic oil
6 production. We'll get that from two
7 components: one, the oil that we would get
8 from out of the ground, and second would be
9 the oil and fuels that we would produce by
10 deploying CTL technologies.

11 That amounts to about 6 million
12 barrels per day at the implementation of this
13 full technology, which would take several
14 years to do.

15 Integrated deployment would bring
16 widespread economic development. In the
17 presentation that Assistant Secretary
18 McConnell did, he showed how we had oilfields
19 deployed across the country, and if we were to
20 use these technologies in these different
21 regions, we would have widespread economic
22 development in places like the Ohio valley, in

1 the southwest and areas of the type shown in
2 Chuck's presentation.

3 Deployment of these technologies
4 would result in reduced emissions, depending
5 on the amount of capture, 60 percent, 90
6 percent, in power plans that would be
7 retrofitted for CCS.

8 We could sequester the amount of
9 CO2 equivalent to about 100 gigawatts of coal-
10 based power. New plants should be
11 strategically sited. We would want to
12 integrate where we locate the new plants
13 compared to the chances for disposal, as
14 Secretary McConnell described.

15 We would need a national network,
16 as always he has described, a network of
17 pipelines that would serve these plants to go
18 from the carbon capture location to the carbon
19 injection location, which would be integrated
20 where they would be needed as a national
21 network to take advantage of all the resources
22 that we have.

1 Coal to liquid fuel plants have
2 been around for a long time, and we know that
3 they can be sources of high quality fuels, and
4 they also have low carbon capture costs
5 because of the way these processes work. They
6 would be integrated very easily into this
7 scenario.

8 Depending upon the dispatch factor
9 we can show that coal-based plants are more
10 economical in terms of return on investment
11 than natural gas plants.

12 For example at 80 percent
13 dispatch, maybe the return on investment is --
14 or the cost of CO2 is \$57 a ton but if the
15 natural gas plant works at a lower dispatch
16 rate, it could cost \$100 a ton for capture.

17 Two points we made on regulatory
18 acceptance that's needed to promote this
19 deployment: one topic is recognition that
20 using CO2 in this manner is a valid emissions
21 control technology; the second one, that we
22 would want the regulatory agencies to look at

1 the deployment of CO2 in this manner as a
2 class two injection well process, as opposed
3 to the class six process which is proposed for
4 carbon sequestration.

5 The Council has examined that
6 substitute or synthetic natural gas, depending
7 on your choice, in many reports in the past,
8 and we again confirmed that SNG is a viable
9 coal use option looking into the future, both
10 concerning national and global kind of
11 considerations.

12 Our recommendations are very
13 similar in some senses to what you heard from
14 Assistant Secretary McConnell. We need
15 regulatory certainty. If industry has
16 regulatory certainty we can then move forward
17 to deploying these technologies.

18 We need continued demonstration
19 projects. The cost of bringing down the first
20 of a kind to the nth of a kind needs to be
21 determined and we learn many, many things from
22 these projects.

1 We need to find ways to continue
2 to support demonstration programs. We must be
3 attentive to the fact that generating new
4 industry requires us finding the workforce
5 that can help us implement that industry.

6 While industry and academic kind
7 of units will accomplish the training of these
8 new workforce expertise areas that we need, we
9 would appreciate support from the Department
10 of Energy as they have done in the past in
11 promoting workforce development.

12 We know that many states are very
13 good at developing regulatory practices. The
14 state of Texas would be one that would come to
15 mind.

16 As we look at deploying these
17 technologies around the country, it would be
18 useful if states would work together with
19 guidance from fossil energy for example, on
20 how we can develop good regulations that could
21 be deployed very quickly.

22 Long-distance carbon dioxide

1 pipelines may be needed in some cases. Even
2 the ones that are short term would require
3 cooperation of a lot of entities in order to
4 put these pipelines in place so we could then
5 begin to deploy the EOR technologies.

6 Chuck described the work that has
7 been done with the regional carbon
8 sequestration partnerships that have described
9 how we can sequester CO2.

10 We believe that a lot of
11 coordination and effort can be expended in
12 helping us move forward with EOR CCUS kind of
13 technologies by taking advantage of the work
14 that the fossil energy office has already done
15 and has demonstrated the kind of leadership in
16 putting these programs together.

17 Co-production of liquids and
18 biomass we view as a win-win situation --
19 provides CO2, provides a useful fuel. We
20 believe that integrating biomass in with the
21 liquid fuel production would be a benefit, and
22 recommend that we search for ways, taking

1 advantage of the EOR CCUS opportunities, we
2 can then help stimulate this industry in the
3 United States.

4 As Assistant Secretary McConnell
5 described, it's important that we continue the
6 fundamental work to advance our clean coal
7 technologies. He showed a wide range of
8 topics that we need to work in. It's
9 important that we continue to support the
10 advanced coal technologies program as we move
11 forward.

12 And the last recommendation we
13 mentioned is that it would be very helpful if
14 the Assistant Secretary would take advantage
15 of any opportunity he had in his forums to
16 talk about the advantages of CCUS EOR
17 technologies to promote its deployment, and I
18 think Assistant Secretary McConnell has done
19 a very good job at the beginning.

20 That consists of our report Mr.
21 Chairman, thank you for the opportunity.

22 (Applause.)

1 MR. PALMER: So our Chair worked
2 pretty hard on this study. So I suggest we
3 give him another round of applause to express
4 our deep appreciation.

5 (Applause.)

6 MR. PALMER: A lot of hard work
7 went into this. I was in the peanut gallery
8 throwing peanuts now and then but not too
9 often. So you know, when you read the report,
10 the power of this report is really something.

11 The incremental annual coal
12 production from the activity identified in the
13 report is well over 400 million tons of coal
14 a year for a 40-year period.

15 These are long-life assets that
16 will become part of the industrial framework
17 of the United States, leading to an industrial
18 rebirth in many parts of the country -- jobs,
19 higher incomes, more people living longer,
20 living better, life itself, like the coal
21 miners the Secretary showed on his slide.

22 So it's -- when you believe deeply

1 in coal, as the members of this Council do,
2 and you look at this study, and you see the
3 power of the study and you see the power of
4 what's identified in terms of our future as an
5 industry, and coal utilization, the current
6 difficulties notwithstanding that the coal
7 industry is going through, will pass, and we
8 will come out of this ready to go for the
9 future.

10 EIA itself has coal use going back
11 to a billion seven hundred millions tons of
12 coal a year and I'll take you over on the --
13 particularly with the enhancement of the EOR
14 aspects of this.

15 So our job here today is to
16 consider this study and to adopt it, and to
17 advance that, I'm going to move its acceptance
18 by the full Council and I would entertain a
19 second at this time.

20 Thank you Jacqueline. So --

21 MR. BECK: I'm sorry, Fred. Can I
22 ask who the second was for the record? I --

1 we couldn't see.

2 MR. PALMER: Jacqueline Bird.

3 MR. BECK: Okay. Jackie Bird.

4 MR. PALMER: I'll call for
5 discussion, questions, comments at this time.
6 You are not allowed Bob. Yes, all the way
7 back.

8 MR. REUTER: Fred Reuter,
9 environmental representative. The first
10 recommendation is regulatory certainty and of
11 course this is given as a reason why
12 investment isn't occurring right now.

13 It's my understanding that
14 frequently projects have to be in place before
15 one knows what regulations have to occur, or
16 am I mistaken about that? I just don't
17 understand.

18 MR. PALMER: Well, there is a
19 regulatory regime in place at the
20 Environmental Protection Agency and at the
21 state level, and of course there's been an EOR
22 industry for decades in the United States and

1 Danbury makes its living doing that.

2 Occidental Petroleum is aggressive in that
3 space in California.

4 But if you went out today to put
5 in a greenfield plant, there are regulatory
6 issues. Let's say you wanted to go -- you
7 wanted to go into the Gulf states and put in
8 the summit project for example. There are
9 regulatory uncertainties at EPA as to how they
10 are going to treat them, with respect to the
11 classification, are you really sequestering
12 CO2, do you have to measure it, why do you
13 have to measure it, how do you measure it,
14 what kind of certainty do you have to show in
15 terms of long-life capture.

16 I'm not suggesting that these
17 questions should be asked and answered. I am
18 saying that it is uncertain now how EPA would
19 react to a greenfield project with respect to
20 enhanced oil recovery.

21 I think the state issues are
22 really not that substantial but I do think the

1 EPA issues are substantial, and as the -- as
2 that section makes clear.

3 That section, by the way, was
4 drafted by -- not Frank -- but Kipp
5 Coddington, a lawyer in the area who was
6 expert in carbon capture utilization and
7 storage and the legal issues surrounding that.

8 So Kipp is probably as
9 knowledgeable as anybody in the country on it,
10 and I think the chapter reflects that.

11 MR. THOMPSON: Good morning. Can
12 I be heard -- are you able to hear me? John
13 Thompson, clean air task force. My first
14 meeting at the National Coal Council.

15 I'd like to just thank the
16 committee and everyone who has been involved
17 in the study for their hard work, and I had a
18 process question.

19 There's still a gap between the
20 cost of capture and the value of CO2 for EOR
21 and the report describes working with the
22 Department of Energy to find financial

1 incentives or other ways to close that gap.

2 And my process question is, is
3 will the coal council be doing any follow-up
4 studies to give guidance to the Department on
5 incentives or other programs that might help
6 to close that gap?

7 After all the report identifies
8 \$60 billion in tax benefits. It seems that
9 some of that money might be earmarked to close
10 some of that capture gap.

11 MR. PALMER: Thank you. That's a
12 really good question and we had a lot of
13 discussion surrounding that. Earmarks are
14 pretty controversial, and tax credits are
15 pretty controversial, and we felt that to --
16 it's better to make these -- the people that
17 are going to advance these projects from a
18 business standpoint for sure will be companies
19 and individuals, whomever, for sure will be
20 going to the federal agencies where they
21 potentially could get financial assistance or
22 to Congress to advocate on their own behalf.

1 But we felt that if we got in the
2 business of advocating tax credits or tax
3 incentives for this, given the budget
4 environment here, that the study would get
5 lost in that argument and that it is better to
6 put it forward on a business proposition.

7 It is profitable today,
8 absolutely. It's not profitable to take a,
9 you know, a post-combustion capture plan, or
10 existing super-critical capture plan and then
11 have to build a 500-mile CO2 pipeline that
12 might be in the Mississippi valley or the Ohio
13 river valley.

14 Those aren't as such profitable.
15 But a greenfield project is profitable and I
16 think over time, as this industry develops,
17 then you can make -- take the initiatives that
18 you are talking about in terms of going to
19 Congress or to the state agencies for
20 financial assistance to do it.

21 That in turn is dependent on, you
22 know, what are we going to be when we grow up

1 in terms of our regulatory regime for carbon,
2 what will that look like five years from now
3 or 10 years from now, which is going to
4 ultimately get decided by Congress, not by
5 EPA, and what if any goals are going to be
6 established in that process putting a quote,
7 "price on carbon."

8 There was a lot of talk about
9 that. I am personally of the view that there
10 is a price on carbon. It's a positive price
11 and it's paid by people that need the CO2,
12 like the Denburys of the world, and those are
13 all subjects for a later day.

14 Our studies are in response to
15 studies requested by the Secretary, not things
16 that we do on our own or sua sponte as the
17 lawyers say.

18 But I'm sure those are subjects
19 for a later day. What we wanted to do with
20 this study was to put in front of the
21 Secretary and the American people and this
22 city, the most energy-illiterate city on

1 earth, the full potential of coal and the full
2 power of enhanced oil recovery.

3 Any other questions? That was a
4 compliment.

5 (Laughter.)

6 MR. PALMER: Okay. We have a
7 motion and a second. We have had discussion.
8 I would call for a vote on approval of this
9 study by the Council members. All in favor,
10 say aye.

11 (Chorus of ayes.)

12 MR. PALMER: All opposed, same
13 sign.

14 (No response.)

15 MR. PALMER: Unanimously carries.
16 Thank you very much. God bless you all.

17 MR. BECK: I want to just take a
18 second and from the staff perspective, thank
19 all of those over 60 experts that did all of
20 this incredible work.

21 Dick mentioned 15 phone calls of
22 about two hours of duration each. There were

1 lots of other things that were going on. And
2 you have to remember folks, this is a
3 voluntary organization. We got this whole
4 report done without spending a dime.
5 Everybody volunteered their time. There were
6 weekends on Mother's Day. It was an
7 incredible undertaking by a lot of people and
8 from the staff perspective, me, Larry, Pam et
9 cetera, we thank you from the bottom of our
10 heart and especially Fred and Dick with their
11 leadership, and Frank with his tenacity. We
12 certainly appreciate it. And we can get back
13 to communications and finance reports and all
14 that other stuff. Thank you.

15 CHAIR HOPF: Thanks, and I would
16 also, not to repeat, but on behalf of the
17 Council, like to thank our staff, Bob and Pam
18 and Larry, and Fred, Dick and Frank, and all
19 the members, on behalf of the Council, say
20 thank you also. Job well done.

21 At this time, at our fall meeting
22 last year, the executive committee decided to

1 reinstitute our communications committee, and
2 so I'd like to introduce David Surber, who is
3 the chairman of that committee and we had our
4 first meeting yesterday afternoon and he'll
5 give us a report from that committee meeting.

6 MR. SURBER: I plan to speak for
7 approximately four minutes. Chairman Hopf,
8 friends and colleagues on the National Coal
9 Council, the communications committee meeting
10 was held yesterday from 3 to 4 p.m. I am
11 pleased to announce that 30 Council members,
12 as well as staff and special guests, attended.

13 Prior to the meeting all members
14 were provided with a proposed work plan for
15 the committee for 2012 and beyond. The plan
16 was approved with no changes.

17 I would ask that those persons
18 here this morning who did not attend yesterday
19 would please study the work plan and send
20 their reaction to Bob and to me.

21 Also prior to this meeting, we
22 made a wide distribution of a factual press

1 release announcing the date, time and place
2 for the full council meeting. This was
3 distributed one week ago to all major news
4 organizations, television and broadcast media,
5 and even to the VDC and NHK.

6 The committee heard a somewhat
7 unsettling report from Mr. William McBorrough,
8 internationally known expert on threats to the
9 power grid, transportation and communication
10 by means of cyber attacks.

11 A summary of his remarks will be
12 prepared and sent out as soon as possible.
13 Jeff Miller, who handles AV matters, our
14 excellent website and who tapes our meetings
15 and posts this video within hours of today's
16 event, is here this morning.

17 Jeff has worked, has, rather,
18 achieved five Emmy awards for his work on
19 important programs here and abroad, and we owe
20 him our gratitude.

21 I would conclude by reminding this
22 body that the work of the communications

1 committee is to provide factual education not
2 advocacy.

3 Education does not take place
4 overnight, but over time. Thank you for
5 listening.

6 (Applause.)

7 CHAIR HOPF: Thank you, David, for
8 that report. Yesterday afternoon the finance
9 and executive committee held a joint session
10 and at that meeting, both the finance
11 committee and the executive committee heard a
12 report on our 2011 audit that is conducted
13 annually by the firm of Chaconas & Wilson.

14 Following that action, both the
15 finance committee and the executive committee
16 accepted that report. I'm happy to report
17 that the Council received a clean
18 determination, so no issues out of that audit
19 report.

20 I'd like to also take this time to
21 thank all the members who have paid their 2012
22 dues. We very much appreciate that. Those

1 that have still not made their payment, we
2 would encourage you to do so. You can work
3 with Bob and Pam to make that happen.

4 It's because of those financial
5 dues, enables us to do the work as a Council
6 that we are able to do, to move forward with
7 the studies and those type of things, even
8 though, as Bob referred, all the hours was
9 donated, and volunteer hours, it still takes
10 dollars to make that happen overall and run
11 the Council.

12 So we very much appreciate that
13 and please encourage everyone else to do. As
14 we know, the economy is tight and every
15 company is looking at every dollar they spend,
16 and picking and choosing their choices, but
17 the work we do here, we feel is very
18 important, so we ask you to continue that.

19 It's very critical and as we move forward with
20 our mission and try to move things forward.

21 So at this time, we're going to
22 take about a 10-minute break and then we'll

1 come back with the next presentation. So it's
2 20 after, so we will resume at 10:30.

3 (Whereupon, the above-entitled
4 matter went off the record at
5 10:21 a.m. and resumed at 10:35
6 a.m.)

7 MR. BECK: Thank you. We still
8 have two excellent presentations to get
9 through, and also we have to elect officers
10 and do some other housekeeping things here.
11 So --

12 All right. For the purposes of
13 the court reporter, we are back on the record.
14 Thank you ladies and gentlemen. We are
15 reconvening the spring meeting of the National
16 Coal Council.

17 My name is Bob Beck and I'm the
18 staff guy. I think most of you guys know me,
19 but again, for the purposes of the record.
20 Our next speaker is Steve Melzer.

21 Steve was, as you know from Dick
22 Bajura's presentation here earlier, was one of

1 the lead authors in our recently-approved
2 study, and is a recognized expert in the
3 enhanced oil recovery business, and he's from
4 someplace down in Texas.

5 But I got an email from Steve on
6 Wednesday morning, just two days ago, and he
7 said, "Hey," he said, "I hope you weren't
8 counting on me being at that Friday event. I
9 got some travel plans that conflict and I
10 don't think I can be there."

11 Well, I had a heart attack right
12 there in the office because I didn't know what
13 I was going to do to plug the hole. So I used
14 all of my persuasive talents, and I told him,
15 I said, "That's not acceptable. You must be
16 here."

17 So anyway, we do greatly
18 appreciate Steve finding time in an incredibly
19 busy schedule, first of all to do all the
20 excellent work within the study that we just
21 concluded, and also for joining us here this
22 morning.

1 So, without any further ado Steve,
2 it's all yours. Thank you very much.

3 (Applause.)

4 MR. MELZER: I did that on purpose
5 Bob. Well, I am a little bit of a duck out of
6 water with this group. You know, I think I
7 knew two people on the committee when we
8 started this report, but made some good
9 friends along the way and it's been fun

10 I have always been a fan of coal.
11 I look at the producer world as a whole, not
12 a little bit unlike some of my counterparts in
13 the oil and gas industry, but we are all in
14 this together.

15 In fact, the only industry I think
16 gets beat up worse than the oil industry is
17 you guys, and so I have a lot of compassion
18 for you.

19 But I thought what I'd do this
20 morning was give you a quick tutorial. I know
21 some of you haven't looked any deeper than
22 coal reserves. Some of those are pretty deep

1 too. But we'll look at some of the features
2 of oil and gas reservoirs, specifically oil
3 reservoirs, and then talk about EOR
4 technology.

5 And I know some of you have not
6 been exposed to it. Hopefully you'll read the
7 chapter. I guess it's now four -- it got
8 moved from three to four, I think. Yes.

9 And, but we tried to do a lot of
10 what I'm going to talk about this morning in
11 that chapter and basically give everybody that
12 wasn't familiar with the underground and how
13 we do oil and gas, and especially enhanced oil
14 recovery, that background.

15 I'll talk a little bit about where
16 we are as an industry in the EOR world, how
17 much do we use of the CO2, how much oil we
18 produce. It will surprise you I think how
19 much oil we do produce. And who are the key
20 players, kind if give you a feel for which
21 companies are out there doing this.

22 It is a very small sector of the

1 oil and gas industry, I will say that, and the
2 players is not a long list. You have Danbury,
3 who is here, represented here, is clearly the
4 leader perhaps with Oxy, as was mentioned this
5 morning, and Kinder Morgan, some others.

6 But we'll talk about the growing
7 demand for CO2. I was with a producer
8 yesterday who said he is being curtailed 20
9 percent on his CO2 supplies, and it's kind of
10 a growing problem in our industry, the
11 curtailments that are out there. We just
12 can't get enough CO2.

13 And then I'll talk a little bit
14 about some new targets. Secretary McConnell
15 did talk about the residual oil zones. I want
16 to give you a little background for that, why
17 that's kind of an exciting new storm on the
18 horizon, and market issues and barriers.

19 And then finally, I guess I'm
20 probably the biggest fan of what Secretary
21 McConnell is going around saying. We sort of
22 needed that gospel being taught, and so if he

1 says jump, I ask, "How high?" I really do
2 respect the man and his ability to answer
3 questions that drive a lot deeper than his
4 talks go.

5 You know, most of our industry is
6 interested in drilling into a reservoir and
7 producing the fluids back by their natural
8 pressures.

9 As was discussed, in the Findlay
10 area in Ohio that's about all we did up there.
11 And then once you got those pressures
12 depleted, we run off to the next exploration
13 prospect and drill for it again.

14 We are sort of back in that mode
15 with the unconventional shales right now.
16 Ninety eight percent of the industry is
17 dedicated to that goal, looking for those new
18 reserves, getting that fast return on your
19 dollar.

20 And our industry, the EOR
21 industry, is a very long-term industry, and we
22 are looking out 30 years and in our world --

1 Fred addressed that question quite
2 beautifully, I thought, with the uncertainty,
3 you know, and regulatory uncertainty -- it's
4 hard to make a 30-year investment with the
5 regulatory uncertainty that might be out
6 there.

7 And so we do need more of that
8 uncertainty to do long-term investments and
9 you guys know that better than anybody because
10 your investments are all long term.

11 So secondary comes after primary,
12 and we're pretty good at doing this. We
13 reinject with something as cheap as we can
14 find to re-pressure it, and that's usually
15 water, and we'll use formation water for the
16 most part and reinject that back maybe from
17 another formation or maybe just reinject what
18 we produce with the oil and try to keep the
19 pressures high, and then convert some of the
20 producing wells to injector wells and drive
21 the oil from the injector well to the producer
22 well.

1 That leaves a lot of oil behind,
2 as I'll show you, and now if we switch to an
3 injectant that changes the property of the
4 oil, we can get more of that oil, and CO2 is
5 kind of the magic elixir.

6 We can use chemicals and other
7 things but CO2 loosens the oil from the rock,
8 thins it up, makes it less viscous and we can
9 produce a good bit of oil using CO2. So it is
10 a commodity in our world.

11 I will talk in two terms, CO2
12 enhanced oil recovery or EOR for short, and
13 then I'll say flooding and the concept of
14 flooding is usually horizontal, where we are
15 pushing oil from an injector to a producer.
16 It can also be from an added drive, where we
17 are pushing down from say an old gas cap. And
18 so I'll use both of those and they are
19 synonyms.

20 And we can do CO2 flooding as a
21 secondary process. We don't necessarily have
22 to follow a water flood. But we generally do,

1 because CO2 is expensive as Chuck pointed out,
2 and if we have to re-pressure a reservoir with
3 CO2, it may actually jaundice our economics
4 and so we don't like to do that.

5 In the world we are going into,
6 maybe we are going to do a lot more of that.
7 So -- and it's not in pools. I bet you
8 everybody in this room knows that, but it's in
9 porous and the oil is sometimes stuck in those
10 poor spaces pretty well.

11 So just, you know, I mean, we use
12 that term pool especially in Oklahoma, and it
13 sure misleads a lot of people. It's not a
14 lake down there, I promise you.

15 This is how it looks in terms of
16 the percentage of the oil that we would
17 produce from the total oil that's in place, we
18 call original oil in place, OOIP.

19 On primary, a pretty good number
20 is about 15 percent of that oil will come out
21 of the ground by its natural pressure. We
22 have seen some projects that do better than

1 that and we have seen some that do a lot
2 worse, and these unconventional shales do a
3 lot worse. They don't get 15 percent.

4 Secondary, a good secondary
5 project, water flood will get more oil than
6 the primary, but that sort of depends on the
7 reservoir properties. Some reservoirs flood
8 well and some don't.

9 And then along comes this
10 injectant that changes the properties of the
11 oil and we can get another 12, 15 percent.
12 Actually, with today's economics that number
13 is probably closer to 15 percent than it was
14 12.

15 But look how much we've got left.
16 That's still about half the reservoir volume
17 of oil that is still in the ground, so we have
18 got room for more improvement yet and we will
19 probably figure that one out and that will be
20 the next 30, 40 years too.

21 This is how it looks in time.
22 This is one of my favorite fields. We call it

1 gold standard in West Texas, the Seminole
2 project. Hess is the operator and you notice
3 they had the primary phase -- I'm trying to
4 find the pointer, here we go -- the primary
5 phase here and then the secondary phase,
6 really good water flood.

7 And then this came along about
8 World War II, which was a lot of our big
9 production in Texas helped the war effort, and
10 then the tertiary phase here at the end.

11 And you noticed I stopped in the
12 year 2000. I think that will be obvious to
13 you when I get to a later slide and I'll show
14 you what we may want to call quaternary oil.

15 How does it work? Well, I think
16 I've described this already for you but it
17 does dissolve in oil and it changes the
18 viscosity, loosens it up from the rock, and
19 allows it to move more freely in the
20 reservoir.

21 And so we can use it to re-
22 pressure a reservoir, but most often we use

1 water to do that, and then the CO2 comes
2 later.

3 But if CO2 were ubiquitously
4 available, and cheap, we would probably re-
5 pressure with CO2 and skip the water flood
6 phase.

7 In fact Danbury is doing that with
8 two projects on the Gulf Coast right now --
9 Oyster Bayou, which is right across the border
10 from Louisiana, in Texas, and the Hastings
11 Field.

12 And they -- some of you may have
13 had the luxury of going to that field. It's
14 just in the south part of Houston, really in
15 an urban environment, and when people say
16 don't do this in an urban environment, well
17 obviously Danbury thinks you can.

18 And then if you drive to Denver
19 City, Texas and you see these injector wells
20 and producer wells everywhere, and that's got
21 a high H2S and some of you may know H2S is a
22 little bit more toxic and dangerous than CO2

1 ever thought about being.

2 So we can do this. And it's all
3 about public attitude and whether they are
4 willing to be part of the team, if you will.

5 And this last bullet Chuck's got
6 mad at me for saying it this way, but
7 typically 90 to 100 percent of the purchased
8 CO2 volumes will remain sequestered in a
9 reservoir.

10 And the reason I don't use 99.9
11 percent or something is because some of the
12 factors if getting it to the atmosphere are
13 out of our control as an oil producer. It
14 might be a power failure that stops our
15 compressors and so we have got to run the CO2
16 to a flare. We have got to add methane, if
17 you imagine, to combust it, to get a flare,
18 and so it's a doubly expensive proposition
19 when that happens to us. We not only lose the
20 value of the CO2 but we have got to add
21 methane to combust it. So we, as Chuck very
22 accurately pointed out, we try to avoid any

1 losses in the system.

2 And it's been around a long time.
3 The commercial scale has been around since
4 '72, 1972. Maybe not a long time for some of
5 us, but I can consider it sometimes in some
6 audiences a new technology, but it's been
7 around long enough we know a lot about it.

8 Okay. All right. How much do we
9 use, where do we use it, and who are the key
10 players? This is a map of the U.S. obviously,
11 and lots of infrastructure has been built over
12 the 40 years.

13 Coal plant. Most of you are
14 familiar with the Great Plains Syngas Plant up
15 in Beulah, North Dakota. Takes its CO2
16 byproduct and runs it to the Weyburn and
17 Midale Projects in Saskatchewan. Really
18 interesting case history to examine. Had DOE
19 help to get started.

20 Natural gas byproduct, CO2, from
21 the LaBarge field in Western Wyoming, an
22 18,000-foot deep reservoir that's got about

1 two-thirds CO2 with the methane, and they
2 separate the CO2 and then ship it off to
3 Rangely, which is a Chevron project in
4 Colorado and a number of projects in Wyoming
5 to make enhanced oil.

6 Natural source CO2 domes, McElmo
7 Dome is the largest pure source of CO2 that I
8 know of in the world. It's about 98 percent
9 pure and so we take it from a reservoir at
10 9800 feet deep then move it to reservoirs
11 5,000 feet deep in West Texas. It's a
12 transfer process. We make oil in the
13 meantime.

14 Bravo Dome shallower, Sheep
15 Mountain, is kind of intermediate, and those
16 are all pure sources of CO2 as well, and they
17 have been our bulwark, our real major supply.

18 And then we have some natural gas
19 byproduct down here in the south part of our
20 basin, in the Permian Basin, this area here.
21 And then Mississippi and the home base of
22 Danbury resources, and then Wyoming, in the

1 Rockies area, we call it the short, and those
2 are kind of our three main areas of EOR
3 application in the U.S.

4 Mississippi has really grown in
5 the last six to eight years due to Danbury's
6 activity and they get from the CO2 from the
7 natural source field at Jackson Dome.

8 Many of you have seen a proposal
9 they have floated and it's in the report, to
10 take CO2 byproduct from the Ohio Valley area
11 and run it into their pipeline infrastructure
12 and effectively start to displace the natural
13 source CO2 with anthropogenic CO2.

14 If you look at EOR, it's not the
15 only technique -- CO2 is not the only EOR
16 technique. There are others.

17 The ones I have shown here are
18 steam, where we actually add heat to oil,
19 usually a thick oil, to make it less viscous;
20 hydrocarbon gas, we will actually reinject the
21 produced hydrocarbon gas; and then nitrogen,
22 we use nitrogen on occasion.

1 And you can see, this is three
2 decades of growth, the blue, the black and the
3 read, and you can see CO2 is growing. You can
4 see steam is now shrinking and we actually in
5 the last report passed seam as the largest EOR
6 technique in the U.S.

7 Hydrocarbon is kind of going away,
8 the value of the liquids in the hydrocarbon
9 stream are too valuable so people sell it,
10 sell the methane as well and don't reinject
11 it.

12 Nitrogen is sort of like CO2 but
13 you've got to use it at deeper depths, and
14 it's a niche application for -- where nitrogen
15 works like CO2 does.

16 Chemical, and there's a lot of
17 emphasis in the research world on chemical EOR
18 and I sometimes wonder why, because every
19 project is a research project.

20 But you can see the results there,
21 just not very impressive on how much chemicals
22 we use for enhanced oil recovery.

1 This number right here is about
2 100 million barrels per year, and I'll show
3 you a graph of how that stacks up in time.

4 This is a really interesting chart
5 that talks about the amount of annual EOR oil
6 and these are in thousands of barrels a day.
7 So you can see we have climbed all the way up
8 almost to 300,000 barrels of oil a day.

9 And this is the Permian Basin
10 number by itself. You can see we still
11 dominate the EOR picture but our influence is
12 shrinking and the reason is, we don't have
13 enough CO2 and the reason for this decay is
14 exactly that. We have got projects that are
15 economic at \$80 a barrel, and that CO2 that
16 was going to be readjusted or reallocated to
17 other projects is still going into those old
18 projects that are less efficient but very
19 economic.

20 And so we flattened out here and
21 it's kind of disturbing. I finally got the
22 folks in my community saying what I've been

1 saying for five years, we are out of CO2.

2 Some of the suppliers don't want us talking
3 like that. But that's the truth.

4 So how much is used? This is a
5 picture of it. We use about 65 million tons
6 a year of CO2. In the Permian Basin we use
7 almost half that, or a little over half that
8 actually, and three quarters of it comes from
9 these pure underground sources today.

10 About 20 percent comes from
11 byproduct natural gas. You know, a lot of
12 reservoirs have CO2 in them, with the methane,
13 and that's certainly true that the LaBarge
14 field in Wyoming, it's true in our southern,
15 West Texas Overthrust Belt, and there's other
16 places as well. That Michigan dot that was on
17 the map is the same as that. It's a natural
18 gas byproduct, CO2.

19 Ammonia fertilizer, we actually
20 have three plants that have byproduct CO2 that
21 we are putting into EOR. This is the Bula
22 Plant, the coal synfuels plant.

1 We don't have any current ethylene
2 byproduct CO2. Canada does but we don't in
3 the U.S., and ethanol. We had a project in
4 Kansas and it's off now. It was a pilot that
5 DOE funded, and all the refinery CO2 is going
6 into food-grade CO2, which in a total U.S.
7 market is probably five percent of the EOR
8 market, CO2 compared to the CO2 EOR market.

9 There was a question earlier about
10 all the other utilization uses of CO2 and keep
11 in mind that EOR is the big guy on the block,
12 maybe cement or something will come along
13 later and displace some of that CO2 use.

14 But this is big stuff and the
15 volumes will tell you that, so it's sort of
16 the first reaction is to go to the EOR. Tell
17 me how I'm doing on time because I know I'm
18 over. So just give me a five minute -- are we
19 there yet? Okay.

20 And I wanted to specifically point
21 out that coal synfuels, because hey, we are
22 trying to encourage you.

1 These are the players. I listed
2 on top the transportation players, and you
3 will find most of them are down here in the
4 producers too. In fact we just had an
5 announcement last week. Our last
6 non-integrated transporter supplier became
7 integrated. They bought SandRidge Tertiary
8 and so they are going to go flood themselves
9 now. So everybody that is a
10 supplier/transporter is now a producer too, so
11 I guess that says something.

12 But here's the list. I'm listing
13 them alphabetically. The big guys as we have
14 discussed are Oxy and Danbury and Kinder
15 Morgan. Exxon is back in. They left, and
16 they have come back in through XTO now, which
17 they merged with, and so that was good to see.

18 Chevron is all excited about this
19 now because of the big targets and so they are
20 busy getting real. Conoco is still a good
21 player, I think in the future.

22 Growing demand. If you look at

1 the number of projects here on the vertical
2 axis over time, 84 on the left 2012, most
3 current survey from the oil and gas journal.

4 You can see that steady growth,
5 and some of you may remember, I know you
6 remember the coal crashes, well, there was a
7 couple of them oil crashes too, 1986 and 1998.

8 And the good news is we grew
9 through that. I mean, it did de-accelerate
10 our growth, because when you are in single
11 digits dollars per barrel it stretches your
12 cash flow to the limit, but we kept going and
13 that's the good news, is that we went right
14 through that dip.

15 This time frame is really
16 interesting, and it's '86 through '88 -- '86
17 through 2000. I'll blow that up for you on
18 the next chart.

19 We actually grew two projects a
20 year in the U.S. through that period of time,
21 and the oil price on this bottom chart was at
22 average \$19 a barrel in that period of time.

1 So, and people say this is not
2 economic, you know, that \$19 is probably
3 equivalent to \$35 or \$30 now, because of the
4 cost, expenses involved in it, but still.
5 Still, we can grow the industry.

6 There is pent-up growth from just
7 the conventional targets, which nearly
8 everything I've talked about to this point has
9 been, oil reservoirs that produced in primary
10 or secondary, or both.

11 But there's a new set of targets
12 out there, and that's the big carrot out
13 there. And I want to do this for you. I have
14 trouble doing this with a lot of audiences.

15 But normally when you deposit a
16 whole series of sediments and then bury them,
17 subside them if you will, into a basin, then
18 you are generating, as it gets deep enough and
19 hot enough, you are generating a conversion of
20 that organic material into oil or gas, and it
21 migrates into a trap, you know, where it, it
22 may be a stratigraphic trap that you know, it

1 pitches out into shales, or it might be a
2 structural trap.

3 And we in the industry have viewed
4 that as sort of the end-all, for a long time.
5 And then some of us started looking at that
6 and said, "You know, these basins are dynamic.
7 You know, they may have a second stage of
8 tectonics or a third stage of tectonics and
9 they may move around.

10 "And so that oil that was in this
11 trap, part of it might move here to another
12 place. Well, in a sense, that water has to
13 infiltrate to move that oil, so it's Mother
14 Nature's water flow.

15 "And if we go after, with CO₂,
16 that oil that is left after our water flood,
17 why can't we go after that that's left after
18 Mother Nature's water flood?"

19 And we've got 11 projects doing
20 that now in Permian Basin. I think it's the
21 only place in the world that's doing it but we
22 are making about 11,000 barrels of oil a day

1 from those zones today. So it's not just a
2 theory and not just an idea. It's actually
3 been proven.

4 So that's the engineering. We are
5 actually demonstrating we can do that from an
6 economic point of view and from an engineering
7 point of view.

8 And we call these zones residual
9 oil zones. That's where oil was originally
10 entrapped there and now water is in there and
11 -- but the good news is there is about 30
12 percent of that oil still there, still left
13 behind.

14 This is where those projects are.
15 This is the Permian Basin and that's the New
16 Mexico Texas border so it's right off the
17 corner of southeastern New Mexico. We've got
18 three projects under way in New Mexico, and
19 then eight over here in Texas.

20 The Hess project that I mentioned
21 is the Seminole project here and I'll show you
22 the quaternary look at that in a minute.

1 These are actually the three projects at
2 Seminole. There is now a fourth called stage
3 two. They are going full-field with their ROZ
4 development and they have gotten stage two
5 approvals. They are even talking about, down
6 the road, a stage three.

7 This is what it looks like in
8 cross-section with this -- this area of the
9 field had a slight gas cap. The green is the
10 main pay zone and the blue is the ROZ.

11 This is -- gross thickness is 250
12 feet. The main pay was only 160. The net
13 thicknesses are shown. The porosities are
14 roughly a little better in the ROZ.
15 Permeabilities are a little better, flow
16 characteristics, and about the same amount of
17 oil in place in both. In spite of the
18 difference in oil saturation it was 84 percent
19 oil in the porous spaces in the main pay and
20 about 32 percent in the residual oil one.

21 So, well, this, they hate for me
22 to show this, but we -- this was that tertiary

1 bump that I showed you on that earlier plot.
2 Now look at this. This was the phase one
3 pilot. This is the phase two pilot.

4 And here we are charging up the
5 hill on the stage one oil production, which,
6 combined, those three together, they are about
7 8,000 barrels a day.

8 Now, they are out of CO2. They --
9 believe it or not they developed West Bravo
10 Dome to do this project, which is another of
11 the natural source CO2 fields, because there
12 wasn't enough CO2, they knew it, and so they
13 went out to develop a project they had had in
14 their back pocket for a while.

15 It's probably going to be a
16 flatter bump than what is shown here because
17 of the CO2 limitations. That will push it out
18 over time, probably 50 years. I think they
19 will still be out there doing this work in
20 2060.

21 We just dubbed it quaternary oil,
22 just to catch people's attention. I'm kind of

1 like Chuck. I like to have a catchy phrase
2 now and then. So quaternary for some of you.
3 Turns out it's in the dictionary both ways.

4 So how big is the business? Well,
5 we have got a lot of places we have these
6 ROZs. Some of them -- I've seen one project
7 with a 400 foot thickness and lots of oil in
8 place.

9 They don't even have to be under
10 an existing field, by the way. The rest of
11 that is kind of geeky stuff, so we will pass
12 through that.

13 Market issues, and I'll finish up
14 with this section, this -- the issues and
15 barriers to greater deployment, because this
16 really is pertinent to this crowd.

17 You know, we -- I've mentioned
18 this already. My industry is particularly
19 exploration-focused, and part of the reason is
20 that regulatory certainty issue, and part of
21 it is we are just dominated by rate of return
22 mentality. I think Harvard taught us that or

1 something, I -- you know.

2 But if we can get our return back
3 quick, that's the way to do it, and you have
4 seen how long it takes for EOR. So we are
5 pretty exploration-focused.

6 Until the mid-'90s this technology
7 how to do this was really tightly held by the
8 majors, and they started to -- in fact, that's
9 why I'm here today, because they looked around
10 for somebody to help them with taking that
11 information public and I said, "I don't know
12 anything about it." And they said, "Well, sit
13 with us and learn," and I did, and we did the
14 conference, the CO2 flooding conference.
15 We've been doing 18 of those, and short
16 courses on the subject, and really it's grown
17 as a result of the public -- going public with
18 the information.

19 It's very capital-intensive. You
20 know, you've got to convert a lot of wells.
21 You've got to go find a supply of CO2. You've
22 got to run a pipeline to it, and then you have

1 got to have a gas plant to reinject the CO2,
2 the recycle stream.

3 So it's capital intensive and it's
4 not, it's not for the timid. And availability
5 of CO2, and that's a big deal today. And then
6 for a long time there were people out there
7 saying we were just this little tiny niche
8 industry, and it was based on the literature
9 that was in the '80s. It wasn't based on what
10 was going on in the late '90s and early last
11 decade.

12 So we had to go correct that, that
13 view that this could be a lot bigger than
14 people were giving it credit for being.

15 Now there is one place where CO2
16 limitations have not impeded the growth and we
17 give a lot of credit to Danbury for this,
18 because they were able, and they worked hard
19 at expanding the supply from Jackson Dome, and
20 grew their number of projects and their CO2
21 production, EOR production, from that.

22 And this is a graph that they

1 provided me that shows where they think they
2 are going in Mississippi. This is the
3 historical oil production in barrels a day,
4 and then this is where they think they'll be
5 by 2014 or '15.

6 So it's a pretty exciting thing
7 for that state, and the Governor of
8 Mississippi likes them a lot.

9 This is a report recently by Phil
10 DiPietro from NETL and some of his cohorts and
11 he says the state of the art technologies in
12 EOR in the lower 48 has this much of a
13 requirement for CO2 EOR. It's based on an ARI
14 study, Advanced Resources International.

15 And this is how much of it we
16 think we can get out of the current sources or
17 those project that are in planning right now.
18 So we are half short of what we think we can
19 have in terms of supply for just state of the
20 art, it doesn't even include the ROZs.

21 So we have got lots of hope that
22 you guys are going to come and help. And this

1 was some other studies and I'm going to skip
2 through these quick because I know I'm hurting
3 for your time right now.

4 But anthropogenic CO2, this is an
5 energy information agency, and they have been
6 involved in a lot of this. The NPR -- not
7 NPR, National Petroleum Council, NPC, has done
8 a lot of good work and I'm going to meet with
9 them after this meeting a little bit to talk
10 some about what they are doing now.

11 They know they need anthropogenic
12 CO2. They are kind of on the fence about
13 whether anthropogenic CO2 is going to come
14 into play in the 2030 time frame. They are
15 going to be surprised when they see our
16 aspirational case. It blows these numbers
17 away.

18 And then here's their annual
19 energy outlook and where the CO2 will come
20 from, and I can provide these slides. I'll
21 skip through them.

22 And then you saw this slide on one

1 of Chuck's and this is the amount of
2 recoverable barrels of oil based on the ARI
3 work and that's pretty good work.

4 This does not include the up-sides
5 in ROZ either. That all has been after me to
6 give you my number and we are not there yet.
7 We don't know how big this is. So we just
8 signed a contract yesterday in fact, with
9 RPSE, to help try to define this a little
10 better.

11 And this is the closest thing to
12 our aspirational case and this is the NRDC
13 work. That is right. It's the National
14 Resources Defense Council. And they see the
15 reason for doing this, and I guess I give them
16 a lot of credit, because they are
17 environmental, they are an environmental NGO,
18 but they know they are not -- the world is not
19 going to quit using coal and oil, and so they
20 have been -- I could even argue they have been
21 a better advocate than my own industry for
22 this approach.

1 And I put the National Coal
2 Council aspirational case on that and you can
3 see it's just a little bit higher than their
4 best case scenario here. These are three
5 models that they used.

6 So we are not all by ourselves and
7 it's kind of interesting to have a friend at
8 NRDC that thinks we could grow this too. I
9 hear that.

10 And then this is just utilizing
11 the CO2 EOR for CCUS and you have heard that
12 from Chuck. He did a marvelous job presenting
13 that case so this would be redundant.

14 So I don't think I have any time
15 for questions but I'd be happy to answer them
16 if -- okay.

17 MR. PALMER: Steve, thank you.
18 First of all, thanks for participating, and
19 the important work that you did for the study.
20 It gives it a lot of validity and you know,
21 your firm is expert in the field and we have
22 huge admiration for you and what you have done

1 for the National Coal Council.

2 The question really goes to the
3 proposition you posit, and that is the
4 industry is short CO2, which it obviously is.
5 There were a lot of business cases built on
6 the assumption Waxman-Markey was going to
7 pass, and that people were going to be
8 throwing CO2 over the fence for nothing,
9 including some of the oil companies that you
10 mention.

11 And obviously that didn't happen.
12 The coal industry was opposed to Waxman-
13 Markey. If it comes back we are opposed
14 again. The price on carbon needs to be a
15 positive price not a negative price.

16 But the CAPEX in this industry is
17 huge, and the people that have the cash are
18 the majors, and until and unless the majors
19 decide they want to be in this business I
20 think you are going to be CO2 short.

21 Now, then would you agree with
22 that characterization, and if not, why not,

1 and if so, why?

2 MR. MELZER: Well, thank you for
3 those kinds remarks, Fred, and it was a
4 pleasure working with you all.

5 Yes, it is such a capital-
6 intensive business. You have got to have some
7 people with deep, deep pockets. And it's
8 really refreshing to me, I've now got some
9 clients that weren't -- they weren't around
10 five years ago.

11 And I think what changed the
12 equation were the big targets. You know, they
13 don't want to go do a one-off, small, EOR
14 project, just like you probably don't want to
15 go build a one-off, small plant.

16 And so now, all of a sudden they
17 are looking at targets that are billions of
18 barrels of oil in place, potentially, and
19 saying this might ought to be a strategy.

20 And so I do think they -- they are
21 getting more inclined, especially those ones
22 that I've mentioned, more inclined to be a big

1 player in the future of this, and so you know,
2 as you know they have been a player in the
3 coal business before, so it's not too foreign
4 to them, to team up with you.

5 Right, so I'm optimistic. I think
6 the one-off, small guys is important but it's
7 not going to -- it's not going to approach the
8 aspirational case that we have outlined here
9 in the report.

10 MR. BECK: Maybe one more. Norm.

11 MR. KETTENBAUER: Thanks, this is
12 Norman Kettenbauer from Babcock and Wilcox.
13 I was wondering, when you are looking at when
14 you are developing a field for tertiary
15 recovery, after you have done your homework,
16 is there still a lot of risk that you will not
17 get the oil out that you had planned on, or
18 through the studying of the field, can you
19 significantly mitigate any risk to not
20 produce?

21 MR. MELZER: That's a great
22 question Norm. Thanks. It's reservoir-

1 dependent to a degree. There are some
2 reservoirs that are particularly low risk for
3 being able to move oil from one place to
4 another and some that are higher risk.

5 And then in the ROZs there's
6 another set of uncertainties yet. I can't
7 talk about a project that is going on yet but
8 we are still waiting and bated breath for it
9 to start making oil.

10 And it may be a function of the
11 oil type there, that is a little different and
12 not miscible, and I didn't go into miscibility
13 and you didn't want me to go into that.

14 But the -- so yes, there's risk,
15 and it's all about trying to quantify those
16 risks and get a handle on them and the
17 industry is still working on them.

18 The Hastings project, I mentioned
19 earlier, for Danbury, that was not without
20 risk. They put, I don't even -- probably it's
21 close to a billion dollars' investment in that
22 project and re-pressured with CO2.

1 And now they are reluctant to talk
2 about it publicly, but I think they are making
3 big oil from it now, and so -- but our
4 industry is kind of keyed into risk, more so
5 than a lot of industries, because you know,
6 hey, it's all about exploration and Mother
7 Nature doesn't tell you in advance what you
8 are going to find down there so we -- I think
9 those sides of it, we can handle as an
10 industry. But it has still got risk.

11 And what we are able to pay for
12 CO2 may be a function of that risk. So keep
13 that in mind. Great question.

14 MR. BECK: Steve, thank you. In
15 the interests of time we are going to have to
16 move on, but it sounds to me like, if I give
17 you, you know, a day or two notice before the
18 next meeting you can come back and join us
19 again, and we may well want to continue the
20 dialogue back and forth with you and others in
21 your industry and we greatly appreciate what
22 you did for us on this study as well. Thanks

1 a lot.

2 (Applause.)

3 VICE CHAIR EAVES: Good morning,
4 I'm Vice Chairman of the Council. Our next
5 speaker is Daman Walia. He is President and
6 CEO of ARCHTECH where he is responsible for
7 the management and technical direction of
8 biotechnology solutions for the better use of
9 coal.

10 Prior to ARCHTECH, Dr. Walia worked
11 for Atlantic Research Corporation. He worked
12 for United Coal Company, where he worked on
13 improvement in coal preparation operations.

14 He has a Ph.D. and an M.S. degree
15 from Miami University. He also has an M.S.
16 and B.S. degree in geology. Please welcome
17 Dr. Daman Walia.

18 (Applause.)

19 MR. WALIA: Good morning, and
20 thank you very much for the leadership of NCC
21 for inviting me back here. I think I was here
22 about maybe 10 years ago, sharing with you my

1 vision of coal through the biotechnology use.

2 And I'm really excited to be back
3 here. I made it back here about 3 a.m. this
4 morning from Wyoming and so I may be a little
5 bit shaky.

6 But I want to share with you the
7 progress and as I was listening to Secretary
8 McConnell about the -- that we have no choice
9 of either/or. We need both to protect -- to
10 meet our needs as well as protect our planet,
11 or environment.

12 So I asked Jeff to put my last
13 slide first so I can make a case, and please,
14 I guess I've got to control the slides here.

15 I'm not going to take you through
16 all the slides, so let's see.

17 (Laughter.)

18 Oops, I'm trying to get to -- can
19 you back there help me with the second last
20 slide? Not this slide, no. Go back to the
21 slide before this. The second last. I'm
22 sorry I said the last one. Yes, this one.

1 Thank you. Yes, this is the one.
2 There you go. See here we have a, you know,
3 as an entrepreneur, as a scientist, I have
4 looked at, okay, what are the needs out there,
5 and then how can we find a way to fill those
6 needs.

7 And as I've reflected on what I've
8 been doing with coal, you know, coal became a
9 passion to me and I've spent my lifetime, I've
10 failed many times, but I've made many
11 successes, and I want to share with you.

12 But I'm driven by a challenge we
13 face, an opportunity we have, in terms -- you
14 know, we have seven billion of us, dancing
15 around on this globe, and here are, as I
16 reflect on it, the must haves, our desire and
17 wants, from our perspective as well as from
18 the perspective of our planet.

19 Of course from us, we need air.
20 Without air we would not be sitting here and
21 being alive. Water of course, food, energy,
22 shelter and our desire is to have a health,

1 environment, and at once comfort,
2 entertainment, communications and
3 transportation.

4 Now, from our planet's
5 perspective, productive soils, clean water and
6 air, and we desire it to be sustainable and
7 then we want to also sustain our other friends
8 who are on this planet.

9 So this need continues to exist
10 and this in fact has been a battle for our
11 human -- throughout our human history, what I
12 call a battle for the equity of the resources.

13 We have continued to struggle for
14 it. We made progress but we still have a long
15 ways to go.

16 So what I've come to a conclusion,
17 a need exists and we need to fill the need.
18 I was really excited to hear about this -- the
19 potential of the CO2 use in the EOR and I
20 think we can help.

21 So I have even a -- probably one
22 of the nutcases who says that we can balance

1 this globe on a pile of coal.

2 Coal to me is really -- is the
3 human resource, not only just a national
4 resource for our own country but also a
5 resource, or a treasure, for us to be able to
6 balance this, what I've just shared with you,
7 and I'm going to share with you how we can do
8 it.

9 Can we start my first slide now?
10 Let's see. Now, I'm here to share with you
11 how we have made successes with this coal
12 biotechnology there in Turkey.

13 And you know, this was a great
14 opportunity, where the head of the national or
15 the coal enterprise from Turkey came to us and
16 asked me to bring my solution into Turkey,
17 duplicate what I have done here.

18 And so I built these mobile units,
19 took them there, and basically this has
20 allowed me to demonstrate that we can take
21 coal, produce into energy product as well as
22 other products for agriculture, water

1 treatment and dealing with many waste issues,
2 and create zero waste out of it, and do it in
3 a way that it can make a -- succeed in a big-
4 time in terms of creating economic value.

5 My company is here based in
6 Washington, and as you have read in my resume,
7 I came to Atlantic Research to help them in
8 the coal slurry technology.

9 But prior to that I was at United
10 Coal and worked with Dick Wolfe and in fact I
11 had Pam look at it, and I was involved in
12 actually helping start this National Coal
13 Council in the mid-'80s, when I worked with
14 Dick Wolfe. Some of you probably will know
15 him, and our President Jim McLaughlin was I
16 believe the first chairman of this National
17 Coal Council.

18 And the objective was to bring the
19 experts who can then guide and advise our
20 government.

21 Of course, you know, after having
22 failed many times in coal, developing and

1 demonstrating technologies for coal cleaning,
2 we failed miserably because the economics
3 could not be made to work, we tried to build
4 a coal to gasoline plant in Virginia. We
5 failed. The oil prices came down.

6 We developed the coal slurry
7 technology, which is the cheapest way to take
8 coal, make it look like oil, burn like oil and
9 that failed, of course, bad combustion and a
10 number of these things.

11 So really today we don't have much
12 to show for and as a scientist it bothered me.
13 So I said we need to find another angle to
14 tackle this scenario.

15 And the reason we continue to
16 fail, not the technical or the science or the
17 engineering part, but more was the economics.
18 And so I took on to tame the coal using the
19 bugs, the microbes.

20 And this is kind of history. I
21 did some work with the Department of Energy.
22 We were one of the success story. We have a

1 number of patents.

2 But why coal? Not only that this
3 is, as I shared with you, that this is a human
4 treasure, but also this is the cheapest carbon
5 we have on this planet earth.

6 And I have given a comparison
7 here, I'm sure all of you know it. And it's
8 abundant, it's available in very concentrated
9 quantities and we can recover it, we can use
10 it, we have tremendous companies and manpower
11 who have been doing a wonderful job in pulling
12 this out.

13 The challenge we have faced is
14 here. When I came to this country, I had \$8
15 in my pocket when I landed in New York. And
16 I used to pay 25 cents a gallon but I was
17 blessed to get an education.

18 And as I came out of school at
19 Miami of Ohio, Ohio was a great place,
20 wonderful people, I saw of course the first
21 oil embargo of 1973 changed the whole
22 scenario, because until then -- this is a

1 graph I am sure many of you have seen but I am
2 going to give you kind of my perspective and
3 the reason what had continued to challenge me,
4 and I'm sure many others -- that even the gas
5 used to sell cheaper than coal.

6 So the oil was somewhere average
7 \$2 to \$5 a barrel, '73 changed that. And
8 since then, we had almost seven times up and
9 down, the prices of oil going up, came down.

10 And the small insert there shows
11 the cost of the production. The two lines
12 there you may not be able to clearly see it,
13 but what they are showing is that the cost of
14 production of oil in the Middle East
15 countries, is the lower line, still continues
16 to be very low, somewhere \$2-\$5 a barrel. The
17 upper line is in the rest of the world,
18 especially in the North America. Cost is
19 somewhere in the \$20-\$25 or \$15-\$25 a barrel.

20 So here's what is our challenge.
21 This is what we need to beat. Here is an
22 evidence from the Saudi Arabia, and I sell

1 them my products, so I got to know the royal
2 family quite well.

3 And here is the Saudi oil minister
4 appears on 60 Minutes, makes these three
5 points, they were not drug dealers who are
6 making you addicted to oil. You need it. We
7 have it. And we are going to sell it to you.
8 You don't have alternates, and it costs me
9 less than \$2 a barrel to produce oil.

10 Here's another quote from the
11 media, the Saudi Prince Talal, in an interview
12 with Fareed Zakaria just last year, he said
13 that if you develop technologies, we will drop
14 the oil price, and you do not have -- and we
15 don't want the West to develop alternates,
16 because they need us, they need our markets.

17 And I have argued for breaking the
18 OPEC in front of the defense council and if we
19 break OPEC, we will hopefully get the whole
20 humanity out of this bondage we have due to
21 the high energy prices, and I'll retire.

22 So what I have done here is to

1 take coal, using the microbes. We looked at
2 microbes from all over the world. I think I
3 have come here in the past, given you somewhat
4 my history of what I have done.

5 But my success came from the
6 termites, and we took termites, kind of
7 tricked them on eating coal by giving them a
8 mixture of sawdust and coal, and the ones
9 which were able to live off coal, we isolated
10 the microbes, and now we can grow them at our
11 will.

12 And basically what I have done
13 here is built a big termites, because the
14 termite is the nature's full gasification
15 plant. It has the jaws to break up. It has
16 three stomachs. In the first stomach it
17 breaks up that, you know, especially it goes
18 after wood, but the wood contains lignum so it
19 has unique group of microbes which can break
20 the lignum, which is the glue, and it's the
21 same component which is the coal, gives is a
22 challenge.

1 And so we take it through these
2 two steps to produce gas, and the other
3 marvelous thing they do is they enrich the
4 remaining material into humus or the humic
5 material.

6 We take this and using the aerobic
7 microbes and chemicals to produce humic
8 products.

9 So my challenge was, well Daman,
10 that's a wonderful story but what are you
11 going to do with these humic products? Who is
12 going to buy it?

13 So I had to go, prove this out and
14 I built a plant. This plant has been
15 operating for last several years producing
16 these products and these products are now in
17 use.

18 In fact, I've seen this in
19 government publications, that this is one of
20 the -- the use of the termite model is one of
21 the transformational technology. Dr. Chu
22 makes a point that -- and they show that how

1 the termites can take these materials, produce
2 the gas or hydrogen and inside is the humic
3 acid.

4 So here's a business model which I
5 had to then wrestle with and come up with, and
6 I learned from what Rockefeller did with oil.
7 He figured, because of necessity of -- the oil
8 in Ohio was high in sulfur compared to the oil
9 compared to the oil which was in Pennsylvania
10 -- can I get some water please?

11 So this high sulfur oil, when they
12 made kerosene, it stunk, so he goes to some
13 scientist to figure out a way to make it into
14 a non-stinking kerosene and they used
15 chemicals, catalysts, to make into low-sulfur
16 kerosene, but they are left with residue.

17 So Rockefeller was smart. He made
18 the residue into asphalt and of course the
19 first oil refineries were built primarily to
20 make kerosene and asphalt.

21 So the oil industry has done a
22 marvelous job on using that particular

1 business model as a way to build a large
2 market and use up the oil in many, many
3 markets. On our own, probably we can sit here
4 and calculate probably 60, 70 percent of the
5 products are made from oil.

6 So the business model they have
7 continued to use very effectively is that when
8 you take and plot every -- all the commodities
9 on a quantity versus the price per unit, they
10 all follow on a curve a like that. You can
11 even do it on in grocery store and you will
12 find this to be the case.

13 So the non-energy products, which
14 basically drive the economics of the energy
15 production because energy we need in a large
16 quantity, but we need to produce it at a low
17 cost.

18 So we tried to follow this model
19 with coal, using our synthetic approaches or
20 chemical, thermal processes. But we were
21 making same products which we can make from
22 oil.

1 So when oil prices came down,
2 those technologies failed. So what I have
3 done is different. I have taken coal and
4 going back to its inherent makeup, which is
5 being of a plant origin, is essentially coal
6 is not a fossil fuel. If it was a fossil, it
7 shouldn't burn.

8 You know, coal is a biomass. And
9 coal in fact is not a hydrocarbon, it is a
10 humate. And once you start looking at it from
11 that angle, all of a sudden everything makes
12 sense, and it's a wonderful material we have.

13 So we take coal and put through
14 this anaerobic fermentation to produce gas and
15 then the remaining coal is into these non-
16 energy products which have multiple uses and
17 applications out there.

18 So with this approach, not only we
19 can virtually eliminate any CO2 issues related
20 to the coal use, and in fact the coal becomes
21 the solution. We don't need to beat our head
22 against oil and gas, but by using these coal-

1 derived products we can actually start
2 capturing CO2.

3 In fact, we even have a way to use
4 these products to capture CO2 which can help
5 in this EOR scenario.

6 So here is what I understood, that
7 when we look at where is carbon in this
8 planet, these are the major storehouses. Of
9 course the largest storehouse for the carbon
10 are our sediments in form of limestone, marble
11 and other things, then of course in our ocean
12 waters and the fossil fuels, then in the
13 atmosphere, then of course in the land in form
14 of biomass or as humic substances.

15 So currently what we are doing is
16 we are putting our fossil fuels to use for
17 meeting our needs and we are shifting that
18 carbon into the atmosphere.

19 Then we are also stripping our
20 soils of these humic substances or humic
21 matter and sending it to the oceans. So we
22 need to find a way to reverse this change so

1 that we can create that sustainable approach.

2 Again, this is just a recent
3 United Nations report making a case that with
4 the nine billion population we will have by
5 2050, with our current approaches to use of
6 our food production we will not to be able to
7 produce enough food to meet the human needs.

8 And so the biotechnology has made
9 a major contributions in many, many
10 industries. Of course many of us every
11 morning take pills which are coming out of the
12 pharmaceutical industry made from the
13 biotechnology, in agriculture, in energy side,
14 in the mining and environmental.

15 So scientists, over the last
16 probably, you know 30 to 50 years, have made
17 major inroads. In fact, I just came back from
18 Wyoming where there were 160 scientist
19 researchers who came from eight different
20 countries and talked about the biotechnology
21 for coal so was really very happy to see,
22 because I have kind of been the pioneer and

1 the lone soldier in making this coal that we
2 can make the bugs and the coal to gas
3 together.

4 So here's what I did in Turkey,
5 bottom line. Take a ton of coal. You produce
6 60 cubic meters of gas, and we produce these
7 products. HUMASORB is my product for water
8 filter. Another HUMASORB liquid which can
9 actually take CO2 from the stacks or for many
10 other applications. ACTI-SOL is the organic
11 fertilizer and Ajax is another chemical we
12 make from the humic materials which we have
13 used to convert militaries' old explosives
14 into fertilizer. So I have built plants for
15 militaries all over the world, you know, to
16 use this approach as a way to recycle their
17 explosives into useful products.

18 So these are the products we made.
19 And these products have been tested in looking
20 at the germination. In fact, not only I took
21 the unit there but I built a research facility
22 in Turkey, trained their people who are now

1 doing this work themselves.

2 We got the government approvals of
3 the use of the products. These products we
4 have tested and compared with the products we
5 make in the United States.

6 This is an example of one of the
7 products for ability to remove a variety of
8 these toxic metals, and you can see that
9 virtually the products made from coal can
10 remove 100 percent or 99 percent plus of these
11 many, many toxic chemicals.

12 Coal is a wonderful material which
13 has many, many attributes which we can
14 exploit.

15 Here's a use of the HUMASORB of
16 liquid product. In fact, many of you, when
17 you drank coffee or tea this morning, you
18 actually drank humic acid.

19 And the humic acid is the water
20 soluble, organic material, and it has a unique
21 property, that when you lower its pH, it
22 proteinate or becomes precipitate, and you

1 can test this yourself when you next time have
2 some tea, squeeze some lemon juice and let it
3 sit and watch what will happen. You will see
4 the color will go down and at the bottom, you
5 will see this brown material.

6 In fact now I think I know how the
7 coal was made. I can make a coal in a --
8 today I can show it to you if you come to my
9 lab.

10 Here we are showing its ability to
11 remove perchloroethylene, trichloroethylene
12 and a variety of things. We have used this
13 product even to take animal manures, chicken
14 manure, pig manure and all kind of things, and
15 completely destroys odor, pathogens and turn
16 into a useful fertilizer.

17 This is in -- we also did test
18 work in Turkey. In fact, my interest really
19 from Turkey came from the military side. Many
20 years ago they came to me, they invited me to
21 come and show them how we can convert their
22 explosives into fertilizers so we took again

1 one of the small unit, which is put in test
2 there.

3 So these are the number of again
4 products made from the -- explosives into
5 fertilizer, germination test. The other
6 application of this technology is to apply to
7 the industry towards standard coals, like we
8 are talking about here, the oil, the same way
9 when we look at coal, you know, we are only
10 playing around with 10 percent of the coal.
11 Ninety percent of the coal is still
12 unmineable.

13 In the U.S., according to the U.S.
14 Geological Survey, we have about 5.6 trillion
15 tons of coal, which would not be mineable with
16 our current approaches, and it's -- in fact
17 Wyoming is one of the state with one trillion
18 tons and I have contracts and project
19 activities in Wyoming right now, and --

20 So this is it, we have done the
21 test work in Wyoming to show the amount of gas
22 which can be produced from these unmineable

1 coals, and in fact our projections are that we
2 can produce gas from coal for less than a
3 dollar per million BTU.

4 And this is the production
5 projections. Here's an interesting -- the
6 business case. What I've done here is to show
7 that if I take the mined coal and at the same
8 time I apply this to the unmineable coals, I
9 produce gas. I produce these products and
10 these are the values.

11 So from coal, and this is sort of
12 an economic analysis in Turkey, like at \$40
13 per metric ton, we will create a total value
14 of \$608 million.

15 So basically from a ton of coal we
16 are creating a \$6,000-worth value. If I tell
17 you what I am doing here in Virginia, it will
18 simply shock you, and -- but this will create
19 a net income of about, you know, here you can
20 read it, it's about 300 or internal rate of
21 return at about 45 percent.

22 So the capital cost for this

1 plant, to build the initial step, is 30
2 million, by additional 15 million in a second
3 step, we can make this into a fully integrated
4 plant.

5 And those back there show that
6 what are the potential applications of these
7 products which can go into that. So this
8 approach essentially creates zero waste. In
9 fact at my plant in Virginia the only drain I
10 have is a toilet. There is no other drain
11 where any liquid waste goes out. The only
12 solid waste that goes out are the packaging
13 materials and other things, so every ounce of
14 coal comes in goes out as a product.

15 These are the various market needs
16 in Turkey because the question I was asked
17 always is that okay, if you apply this
18 approach, then is there a sufficient market.

19 So not only in Turkey, but in the
20 U.S., our estimates are, based on some of the
21 professional market analysis we have done,
22 that this approach could utilize about 600

1 millions tons of coal on a yearly basis to
2 meet not only the energy needs, but in the
3 water treatment, agriculture and many other
4 application.

5 So last week, Mr. Ildis came and I
6 saw in your package you have the press, one of
7 the reports, he came and gave an approval to
8 go forward with this project.

9 I have signed a joint venture
10 agreement in Turkey and we will go forward to
11 build a plant, and this is what it will look
12 like.

13 And I would like to build one of
14 these here in the U.S. Now, the challenge in
15 any biotechnology is the residence times. In
16 our thermal chemical processes, our residence
17 times are small. So the heart of the reactor
18 is very small. But it's the back-end systems
19 to treat the gas, do other things, become huge
20 and costly, whereas in this case, the heart of
21 the system is the bioreactors which are very
22 large.

1 So I'm using this monolithic dome
2 construction as a way to build these very low-
3 cost, these reactors, and in fact one of these
4 reactors exists in Germany at Innovation
5 Village, and it costs about 60 euros to go
6 see, and it takes about three months to get a
7 time to go and see those.

8 So I'd like to build one of these
9 here at the CIT building on route 28 near
10 Dulles airport and make this as a showcase, as
11 well as to prove this technology out.

12 We have tested all different ranks
13 of coals. Now I'm going to share with you
14 what we are doing here in the U.S. This
15 technology has been applied -- can be applied
16 from anthracite all the way to lignite.

17 Of course the amount of gas and
18 the composition of gas varies depending on the
19 coal and as well as the byproducts.

20 Again, these are, you know, again,
21 the issues, you know, I've kind of tried to
22 understand what are the issues we face in the

1 U.S. and how this approach can give us a way
2 to get -- solve those problems.

3 This is the plant in Virginia.
4 Some of you will recognize Dick Wolfe. He and
5 I have gotten old talking about coal, and he
6 is still very passionate, and he has been my
7 mentor and he went to see the plant, to look
8 at these products. In fact he is using on his
9 vineyard and growing, making wine.

10 So, in the HUMASORB, this is a
11 huge need in our country. We have 1300
12 trillion gallons of waste water which need to
13 be treated from many different industries, and
14 it's not being treated or the costs are high.
15 So these products can help meet these needs.

16 Here I'm going to show you some
17 examples of use of these products. The
18 HUMASORB product has been -- actually this was
19 supported by the Department of Energy for
20 their weapons complex, and we showed that we
21 can pretty much deal with 90 percent of the
22 nuclear wastes they have, at Hanford and other

1 places, if these companies would let us come
2 and actually solve the problem.

3 In fact this product can help to
4 open up Yucca Mountain, which continues to
5 pose a big challenge.

6 We have succeeded in its use of
7 the -- in fact the Idaho National Lab have
8 done testing, the Army has -- we put its
9 application for depleted uranium, its
10 applications for, at the Paducah Plant.
11 Here's an application for mercury in Oak Ridge
12 issues.

13 I've built -- a lot of success
14 really came from the defense department. I
15 built a system for them at one of their
16 chemical weapons destruction plant and removed
17 21 different toxic metals to comply with the
18 EPA regulations.

19 I've done work in the chemical
20 weapons area to use this coal-derived material
21 to successfully destroy organochemical agents
22 in Japan and other places.

1 Here the product is being used in
2 dealing with the storm water issues. It's a
3 product here dealing with a number of issues
4 in you know, the chlorinated or PCBs.

5 You know, in Pennsylvania we
6 showed that with this product we can recover
7 a saleable product out of acid mine water, or
8 we can even stop the formation of acid mine
9 water in some cases.

10 This -- in Berkeley Pit we showed
11 that we can make actually money out of --
12 while cleaning the water. Here again
13 currently we are demonstrating its application
14 for selenium removal. As I'm sure many of you
15 are hearing, the coal mining industry is
16 facing a big challenge and this product has a
17 unique ability to capture selenium and remove
18 it.

19 We have done some work with power
20 plants dealing with their, you know, these
21 scrubber waste waters, even that the product
22 then, after we capturing the contaminants, we

1 can turn into a solid filter and that can go
2 into a creative way to safely store the coal
3 ash.

4 Here again in municipal waste
5 waters, you know, I just signed an agreement
6 with a major company to supply them this
7 product on a regular basis to use it for
8 dealing with industrial nuclear wastes, as
9 well as storm water needs. Here's an example
10 of its use in drinking water.

11 So the agriculture market is
12 another huge market which continues to beg for
13 solutions, and again, not only for organic
14 food, but as well as, you know, our regular
15 agriculture applications.

16 I have obtained approvals of these
17 products from U.S. Department of Agriculture
18 for use in growing organic foods, U.S.
19 Environmental Protection Agency for its use in
20 combining with pesticide in these formulations
21 to make them safe.

22 My products are listed by the

1 Organic Materials Review Institute. We
2 recently got approval from the South Carolina
3 Department of Transportation for use on their
4 -- as a biostimulant for their road
5 transportation application.

6 So this product is in use up and
7 down the east coast, and many, many farmers
8 are using for -- in dealing with the, you
9 know, increasing the agriculture productivity
10 of soybean, cotton, sorghum and you name it,
11 this product is now in use, and we have --
12 this has been going on for the last 10 years
13 now.

14 Many of you play golf. This
15 product is used by many golf courses to create
16 a robust root system and as well as a -- and
17 again, for dealing with the phosphorus issues.

18 So we ship a lot of this product
19 into the Gulf countries, in Egypt and other
20 places, to help them to convert their sandy
21 soils into fertile lands.

22 So you know, we have a product

1 which we are now using to make these chemical
2 fertilizers into a more effective.

3 So the Actodemil, you know, this
4 is one of the first unit I built where we take
5 explosives. On one end we put in there, and
6 we input our chemical made from coal, and you
7 get a fertilizer on this end.

8 This product actually was approved
9 by the EPA. In their munitions rule, usually
10 you get regulators writing you a letter
11 beating on something you have done wrong, but
12 here the Nevada Environmental Protection
13 Agency wrote me a letter congratulating on
14 what we have achieved.

15 So back to here, this is where we
16 have a big opportunity for coal. And we need
17 to think outside the box. Now, why I am here?
18 Why I know you are all the most leaders in
19 this industry, and have been assigned to look
20 at recommend to the government as to what
21 governments should be spending their funds
22 into this need.

1 So coming to my perspective on
2 coal, is, see, we as the scientists have tried
3 to tame coal with similar approaches as we
4 have been doing with oil, and we have failed.

5 I won't call that we are -- have
6 bankrupted these technologies of -- because
7 right, we don't have plants, built all over,
8 you know.

9 So the reason being that
10 technically we succeeded. But we have not
11 been able to succeed in the economic side, and
12 so unless and until we find a way to deal with
13 all of these issues simultaneously, we are
14 going to face challenge.

15 So that is my pitch to you and my
16 hope that you will reflect on it. I have a
17 one-page business plan for the government to
18 take on this as an approach, to help derive
19 these solutions, and my -- that one-page
20 business plan shows that with a modest
21 investment, there is a potential of about 700
22 percent rate of return on the government's

1 investment in terms of the tax revenues it
2 will generate of course, in terms of creating
3 a green manufacturing economy and others and
4 it will have a broad impact in the coal
5 industry as well.

6 So the coal, I believe, if we take
7 on this approach, can give us a basis of a
8 next industrial revolution, as coal helped us
9 to propel the first industrial revolution when
10 we, you know, used it to burn to make steam
11 and then steam helped us to drive the whole
12 industrial systems out there.

13 So this is the vision I have.
14 This is what I believe is achievable. Now
15 would I succeed doing it myself? You can be
16 damned sure I will do my best.

17 I'm all over the world and this
18 approach is catching on, but I hope that I can
19 help do it in this country because I was
20 blessed to come here with \$8 in my pocket and
21 I dared to dream different, and I intend to
22 hopefully succeed here.

1 So thank you very much. I need
2 your help.

3 (Applause.)

4 I'll be happy to answer any
5 questions if your time permits.

6 MR. BECK: Thank you, Daman. We
7 are up against a wall, but any questions? And
8 Daman is local. He is here in the Virginia
9 area, so we can always put folks in contact.
10 We thank you very much for your time and your
11 presentation. And I think you need to call on
12 me Mr. Chairman for the nominating committee
13 report. Thank you.

14 (Applause.)

15 MR. PALMER: Thank you, Daman,
16 well done. At this time I'd like to call Bob
17 Beck to review the nominating committee report
18 that we discussed yesterday. Bob?

19 MR. BECK: Thank you, Mr.
20 Chairman. The next order of business is to
21 elect the new officers for the new term of the
22 National Coal Council. Traditionally we

1 appoint a nominating committee of past chairs
2 as well as the current chair, and so for this
3 particular committee, Georgia Nelson was the
4 chair. Mike Miller and Joe Hopf were the
5 members.

6 They are proposing, for your
7 consideration and action, for Chairman John
8 Eaves, John as you know is the vice chair, he
9 has also recently added a whole bunch of
10 additional responsibilities for the Arch Coal
11 company, and as vice chair, John Long, who is
12 a long-time member of the Council, and has
13 been a member of the executive committee, has
14 had a long career with Midwest Generation,
15 Constellation, which is now Exelon, and all
16 those kinds of things anyway.

17 I think everybody is familiar with
18 John. So Mr. Chairman, I would ask a motion
19 to -- of approval, I guess, or to vote. I
20 can't do this because I' not a member so I
21 need somebody from the floor to move and so --

22 Okay, we got Mike and Sy. Okay.

1 We'll give Mike the motion and Sy the second.
2 Okay we have a slate of officers before you.
3 All in favor please say aye.

4 (Chorus of ayes.)

5 MR. BECK: Opposed, same sign?

6 (No response.)

7 MR. BECK: Thank you. And
8 congratulations to John and John. We're going
9 to have to start using last names so we know
10 exactly who we are talking about.

11 But I have two things to do before
12 I go. First I want to thank Joe Hopf for his
13 many years of service and for the last two, as
14 being my boss.

15 I always tell people I have a kind
16 of a unique situation. I get a new boss every
17 two years. That's kind of the bad news. The
18 good news is I generally get to pick them.

19 So -- and with Joe, I think we hit
20 the jackpot and I greatly appreciate what he
21 has done.

22 (Applause.)

1 MR. BECK: And I now understand
2 many of you remember from the fall meeting
3 last year, we had a presentation by a group of
4 folks from the National Museum of Forest
5 Service History and they are with us again
6 today as guests, and were here last night, and
7 they informed me that they are giving their
8 highest reward, the Conservation Legacy Award,
9 this fall -- I believe it's out in Vail,
10 Colorado where they are actually going to have
11 the ceremony -- to our new chairman, to John
12 Eaves.

13 So John must be a relatively
14 famous and successful person. We must have
15 made a good choice. So anyway, we just wanted
16 to make that announcement.

17 And John, I guess I'll turn this
18 over to you for any kind of closing remarks or
19 any comments you would care to make.

20 VICE CHAIR EAVES: Thanks, Bob.
21 You know, it's certainly an honor to be the
22 incoming chairman. I would like to just take

1 a moment to thank Joe Hopf. He has been a
2 tremendous leader, real dedication over the
3 last two years and I've certainly learned a
4 lot, and will continue to call on Joe for his
5 counsel and advice.

6 I also want to thank Gray and Liz
7 for their nice award, you know, at Arch Coal
8 we drive the organization on two things.
9 We've got two core values -- safety and
10 environmental performance and you know, it's
11 nice to be recognized for those so we thank
12 the Museum of History and appreciate that and
13 look forward to accepting that award hopefully
14 in Vail, Colorado. Thank you.

15 I did want to take just a moment
16 and thank the members of the study. I mean,
17 that work is strictly voluntary. Long hours,
18 a lot of effort, really a great product and I
19 think we all need to think about how we take
20 this country forward

21 Fred, Dick, Frank, all you guys,
22 thank you so much for all the long hours and

1 the product that came out of it. So we really
2 do appreciate that.

3 Wanted to thank all the speakers
4 today. I think we had some good
5 presentations, a lot of things to think about
6 as we move forward. Certainly in the coal
7 business we are in a pretty difficult period.
8 We have been in these four or five times over
9 the last 10 or 12 years. We will come through
10 this but anything we can do to advance
11 technology, it help everybody in this room.

12 This meeting is duly authorized
13 and publicized and is open to the public. The
14 public can submit comments to the Department
15 of Energy or if any individual wishes to
16 speak, they may do so at this meeting.

17 Those who wish to speak may do so
18 at this time. Is there anybody that wishes to
19 make any comments?

20 (No response.)

21 VICE CHAIR EAVES: Seeing none, we
22 do plan to have the meeting this fall, 2012,

1 here in Washington, D.C. When we have the
2 time, place and date, we will get that all to
3 you.

4 With that, if there's no other
5 business to come before the Council I will
6 adjourn the meeting. Thank you very much and
7 look forward to seeing you in the fall.

8 (Whereupon, at 11:57 a.m., the
9 above-entitled matter went off the
10 record.)

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This is to certify that the foregoing transcript

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Before: National Coal Council

Date: 06-22-12

Place: Washington, DC

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Neal R Gross

Court Reporter

NEAL R. GROSS

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