

BEFORE THE
CALIFORNIA ENERGY COMMISSION

In the matter of:)
)
California Carbon Capture and)
Storage Review Panel Meeting Agenda)

Fourth Panel Meeting

CALIFORNIA ENERGY COMMISSION
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8:30 A.M.

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P R O C E E D I N G S

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2 OCTOBER 21, 2010

10:58 A.M.

3 MR. BAUER: Okay, the Panel is back in session and
4 this is the beginning for the next hour of public comment
5 period, and if any members of the public would like to
6 provide comment, recommendation, I would ask you to keep it
7 to less than five minutes. Those in the room, if you would
8 please identify yourself and we'll try to bring you up to
9 the mic here in the middle, and those who would like to call
10 in, please call in and you'll be set up in line to give
11 comments there, too. And as people call in, I may ask
12 people in the room to wait their turn so we can take their
13 calls and we'll work it back and forth like that.

14 For members of the Panel, let us hear the comments,
15 and I'd like us not to ask questions unless it's a question
16 of clarification, not a position. Thank you. Is there
17 anybody in the room who would like to make a comment? Yes,
18 sir, please come forward, identify yourself, and less than
19 five minutes, please.

20 MR. MONTGOMERY: Good morning. Pete Montgomery, I'm
21 the Executive Director of the California CCS Coalition.
22 These comments are on behalf of Dan Scopek, who couldn't be
23 here today, unfortunately. Dan wanted me to share -

24 MR. BAUER: Just for people listening in, Dan Scopek
25 is a member of the Panel. Unfortunately, he didn't make it

1 up.

2 MR. MONTGOMERY: Dan wanted me to share a couple
3 things, more on procedure, process kind of mindset than on
4 policy. First off, Dan feels very strongly that this report
5 should be delivered in the timeframe to this Administration,
6 so it seemed to me that that might have been an open
7 question, and he wanted me to put that in the room that we
8 have an ally on CCS, we don't want anything to get lost in
9 the transition, we want this document to live, and it was
10 asked for by this Administration, we should deliver it in
11 this timeframe. And secondly, just from a mindset
12 perspective, and this has been said in meetings, previously,
13 Dan asked that the members of the Panel, when looking at the
14 report, think about project deployment, that a lot of the
15 questions that are out there on public acceptance,
16 commercialization, driving costs down, etc., we can go a
17 long way towards addressing those issues by actually getting
18 projects deployed, and I think Sally Benson made this point,
19 and George made this point in one of the first meetings we
20 had, but it's just a mindset to look at on the report, is
21 what is our objective; and, at least from Mr. Scopek's
22 perspective, we really want to get projects, or a project,
23 or one or two projects, deployed in order to move to CCS in
24 California. Thanks.

25 MR. BAUER: Thank you. Are there any calls? Okay,

1 anybody in the room who would like to speak, another
2 comment? Yes, please.

3 MR. KADYSZEWSKI: John Kadyszewski from Winrock,
4 International, and the Co-Lead for the terrestrial component
5 of the WESTCARB partnership. I just wanted to make the
6 comment for the Panel that, within WESTCARB, David Hawkins
7 this morning made a comment on biological approaches to CO₂
8 production that could be geologically sequestered, and he
9 talked about Fischer-Tropsch. There are a number of
10 pathways by which biofuels can produce CO₂ that could be
11 geologically sequestered, and I think it would be a useful
12 thing for the Panel to include in its report, some
13 recommendations or considerations on what the State of
14 California should be doing to accelerate the analysis of
15 those different pathways because they do have different CO₂
16 yields and costs associated with them, and particularly in
17 thinking about an emergency response mechanism, geologic
18 sequestration of biological sources does provide that carbon
19 negative opportunity and could be done in association, but
20 it will require some separate thinking from what would
21 normally go on if the focus is only on coal or gas.

22 MR. BAUER: Okay, and before you, since we do not
23 have somebody else to speak right away, could you just
24 expand a little bit more on - you say various alternative
25 ways other than just captured as the Fischer-Tropsch plant

1 would generate CO₂?

2 MR. KADYSZEWSKI: Yes. The priorities within the
3 Department of Energy Program have been at cellulosic sources
4 of ethanol, and fermentation processes for ethanol do
5 produce CO₂ as a byproduct of fermentation. And so you will
6 get substantial, relatively pure CO₂ production from ethanol
7 fermentation plants, and you already do have this in
8 association with a number of different ethanol plants
9 operating in the United States. Traditionally, those
10 sources have sold their CO₂ into merchant CO₂ markets, either
11 for bottling plants or for flash freezing. But, as you have
12 increased ethanol supply, those markets for those
13 applications have been saturated, so you do have plants now
14 that are venting the CO₂, already separated from their
15 plants. The challenge for those technologies is they're
16 relatively small scale, and so the injection technology that
17 you might use would be different, if you wanted to mobilize
18 that on a rapid basis, than what you would get from a large
19 plant. Alternately, you obviously can combined those CO₂
20 sources into a pipeline structure that would set up. But I
21 think those are some questions that have not been as
22 carefully analyzed, or even laid out as pathways as they
23 could be.

24 MR. BAUER: Thank you very much. Other public
25 comment, anybody in the room that would like to make a

1 comment, or anybody calling in? While we wait to see if
2 anybody wants to, the previous commenter mentioned the
3 ethanol plants, dairy and from fossil energy, showed plants
4 that are in the sequestration projects right now, and one of
5 them is by ADM, it is an ethanol plant in Illinois, and
6 they're looking at about a million tons a year, I think,
7 Darren? So, that is happening there, and they were
8 approached early on and voluntarily wanted to be involved in
9 those projects, as the source of CO₂ for sequestration
10 experiments, so to speak. And so, obviously, ADM sees the
11 potential opportunity that there is to put CO₂ in the ground
12 as maybe some kind of value proposition.

13 Are there other public comments? Please. George
14 Peridas.

15 MR. PERIDAS: John, are you saying that we should do
16 an analysis, recommend an analysis of capture from disbursed
17 sources that relate to biomass? Or were you referring to
18 for lifecycle analysis of the various biomass options that
19 could be used as biofuels, or as combustion material?

20 MR. KADYSZEWSKI: I was referring to the various
21 biomass pathways for geologic sequestration. I think there
22 is terrestrial sequestration discussions of alternative
23 forms that you might sequester terrestrially sourced
24 biocarbon, so there are solids you could use where - I mean,
25 the biochar concept has been talked about. You could just

1 bury wood. You can also look at liquid sources from
2 pyrolysis processes, for example, for injection if you
3 wanted to, although there are other things. But I think the
4 comment I was making for the Panel was specifically about
5 looking at the relative performance of the alternative
6 biofuel pathways in a lifecycle method to see that, okay, if
7 we were to look at the implications of deployment of a
8 cellulosic ethanol platform as your transport fuel
9 mechanism, vs. Fischer-Tropsch's platform for your liquid
10 fuel targets, what would the differences between those two
11 be in terms of the geologic sequestration - assuming that
12 geologic sequestration is coming on, it might send some
13 signals back that would either support, or alter the current
14 priorities given to the various biofuel pathways.

15 MR. BAUER: Other comments from the room? Are there
16 any other people calling in? No. All right, I'll give it
17 another few minutes, if someone else wants to show up, or
18 someone in the room who is trying to decide if they want to
19 add something to the discussion, please step forward.

20 Otherwise, the Panel will move on to start to discuss some
21 of these items that have been brought forth today and in
22 previous meetings, as well as the White Papers and readings.

23 Just for the Panel, I passed out a list of some of
24 the things we've talked about in the past that are areas of
25 possible recommendations, and these are not the

1 recommendation, but a category that might - and I'll just
2 kind of read over them just so they're in the public record:
3 Do we want to make any recommendations on regulation and
4 permitting of CO₂ pipelines? Do we want to make a
5 recommendation around ownership of pore space for CO₂
6 storage? And recommendations could be just that they need
7 further study, further emphasis, it could be legislative
8 language recommendation, and it could be financial. When I
9 say "recommendation," broad brush, the Panel has to decide
10 what they want to, if anything, recommend around these - or
11 just say recognition of the importance. The requirements
12 for Measurement, Monitoring, and Verification, regulatory
13 framework for permitting CCS projects, long term stewardship
14 and liability. As David Hawkins mentioned, he'd like to see
15 those separated as two separate entities. The Panel needs
16 to talk about that, perhaps, or as a related entity. The
17 role of public outreach education input. Commercial
18 considerations, incentives, policy drivers to enable the
19 early movers and, in the longer term, what it takes for CCS
20 to go forward and to make the contribution that appears to
21 be needed as a tool. And the last one there, any
22 discussions or recommendations we might want to bring
23 forward in our report around the Environmental Justice
24 considerations, as well. So, I just read those off so that
25 - those are the categories, I think, over the meetings and

1 the exchanges of written material, and they are on the
2 website we flagged as possible areas that the Panel would
3 want to come together on a recommendation and what that
4 recommendation would be. Are there other comments from the
5 audience here at the meeting? Anybody else who would like
6 to make a statement, point out something other than how good
7 or bad we look? Only good, of course. Yeah, you want to
8 speak to how good or bad we look, okay, please come to the
9 mic and identify yourself.

10 MR. WEBER: My name is Karim Weber and I am on the
11 California Energy Commission. It is a very promising thing
12 to talk about how to clean the environment, how to clean the
13 air of all these greenhouse gasses. The thing is, if we are
14 concerned and worried about the levels of the carbon in the
15 atmosphere as it is now, some entities are going to use this
16 technique to allow themselves to produce more carbon than is
17 allowed by AB 1368. So, if we want to clean the
18 environment, why are we going to allow, or why are different
19 companies going to take advantage of this technology to
20 produce more carbon so that we have to deal with the excess
21 carbon that's being produced, not the carbon that's already
22 in the atmosphere? My other comment is about, you know,
23 there are other greenhouse gases that are there, why are we
24 only concerned about carbon? And the third thing is about
25 the cost, you know, who is going to, you know, if this

1 technology is going to increase the cost of power for the
2 consumer, there are some other technologies that, if we want
3 - if the consumer is going to pay more, why aren't you
4 looking for other techniques or technologies where the
5 consumer will still be paying more and, you know, while
6 producing less carbon and emitting less carbon to the
7 atmosphere?

8 MR. BAUER: Thank you for your comment and your
9 observations.

10 MS. REHEIS BOYD: I would just offer one question,
11 sir. I understand what you're saying, but what I struggle
12 with is, I mean, in the interim, until we figure out how to
13 do it different, how would you expect California to keep the
14 lights on? I mean, power plants have to keep operating,
15 they have natural gas as a source, they are utilizing this
16 technology to try to minimize the impact while they're doing
17 what they do, which is produce electricity. So, until we
18 figure out how to do that in a different way, how would you
19 suggest we proceed?

20 MR. BAUER: Could you speak at the mic because we
21 have people listening in who need to be able to hear.

22 MR. WEBER: If we still abide by the limits that are
23 set by the regulations, you know, and produce more energy
24 while complying and limited by the AB 1368, that's fine, but
25 to come up with - to take advantage of this new technology

1 to allow myself to produce more carbon - you know, like I am
2 finished with one such challenge, the company wants to
3 produce twice as much carbon per megawatt hour, and they're
4 claiming that we're going to sequester the excess that will
5 be produced, so we are giving some incentives for - you
6 know, instead of giving incentives for companies to look for
7 cleaner technologies, we are giving incentives for companies
8 and for investors to come up with some dirtier technologies,
9 but count on this sequestration to get rid of the excess,
10 rather than getting rid of the amounts that will be emitted,
11 originally.

12 MR. MURRAY: Hopefully what we're doing is multiple
13 strategies. Hopefully, this technology is intended to make
14 better those existing technologies, and there are also
15 numerous programs that are directed at incenting other forms
16 of renewables, or things that - you know, cleaner
17 technology. So, this is just a recognition that, in the
18 short term, we have no viable alternatives for some of our
19 technologies, and so this gets them maybe not perfect, not
20 clean, but it deals with the carbon that is put out in the
21 atmosphere now. I don't think it's intended to let people
22 produce more carbon.

23 MR. WEBER: That's good. If we set some condition
24 that, you know, you don't exceed the limits that are set by
25 some regulations, you know, you don't come up with new

1 methods and new technologies that will allow you to take
2 advantage of this new - you know, the capture and
3 sequestration and storage to produce more, you know, as long
4 as you limit yourself with the limits that are already in
5 place, and, while not exceeding them if you want to increase
6 power production, that's fine, you know, now you can
7 increase power production while still abiding and conforming
8 with the regulations that are in place, we can produce more
9 power, and then sequester the carbon that will be produced.

10 MR. BAUER: I think that would be the intent, quite
11 frankly, as Kevin Murray was trying to make the point.
12 George Peridas.

13 MR. PERIDAS: Yeah, let me see if I understand the
14 question. Which regulation are you referring to 1,100
15 pounds of CO₂ - produced?

16 MR. BAUER: 1,100, right.

17 MR. PERIDAS: What is the source of the additional
18 carbon that is produced?

19 MR. WEBER: Well, for example, gasification for
20 hydrogen production will produce about 2,300 tons per
21 megawatt hour.

22 MR. PERIDAS: But that CO₂ is then captured.

23 MR. WEBER: Excuse me?

24 MR. PERIDAS: That Carbon Dioxide is then captured
25 and put into geologic source. What is the source of the

1 additional carbon? That's what I'm trying to understand.

2 MR. WEBER: Well, that's why I'm saying the 1368
3 sets the limit at 1,100, you know, producing hydrogen will
4 emit 2,300, so there is a 1,200 tons -

5 MR. PERIDAS: It won't if you capture it and
6 sequester it.

7 MR. WEBER: That is my point that, you know, they
8 want to produce more carbon per megawatt hour with the
9 intent or with the plan that I'm going to capture the extra,
10 you know, the additional 1,200, instead of capturing the -
11 dealing with the original 1,100 that we were concerned
12 about.

13 MR. PERIDAS: Yeah, but the emissions are still
14 lower than natural gas without CCS. I mean, there is an
15 energy penalty and you are using a fossil fuel to do this,
16 but what the atmosphere feels is still much less than the
17 1,100 pounds if you capture all that CO₂.

18 MR. WEBER: 2,300. We're talking about 2,300
19 pounds.

20 MR. PERIDAS: Yeah, but that 2,300 is not emitted,
21 it is captured and sequestered and the atmosphere never
22 feels it.

23 MR. WEBER: Not all over is it captured, no, the
24 claim is that 90 percent of that will be captured. We don't
25 know exactly how much of that is going to be permanently

1 stored. You know, there are some studies that say the
2 maximum you can store out of that is only 30 percent, and in
3 the end you end up with more than 1,100, but let's even say
4 you end up with less than 1,100, you know, why produce more?
5 Why count on the advantage of this method or this technology
6 to produce more? We want to deal with the levels that we
7 have, that we are worried about, we are concerned about the
8 levels that we already have. So, why produce more and then
9 have to deal with the extra that I'm producing?

10 MR. PERIDAS: Well, I don't know what studies you're
11 referring to, but it seems like you're calling into question
12 the viability of geologic storage of CO₂, which is what this
13 panel is about, anyway, and we are in agreement between us
14 that it is viable and safe to store the bulk of produced
15 emissions underground without - if you pick a good site and
16 you regulate it, operate it well without questioning whether
17 that CO₂ stays, so I fundamentally disagree with your
18 premise. We don't know what happens with that CO₂; I think
19 we know that it's captured and we know that it's
20 sequestered.

21 MR. WEBER: Well, there are some studies and some
22 references that say that you cannot store permanently more
23 than 25 to 30 percent, you know, to be conservative, you
24 know -

25 MR. PERIDAS: Can you cite those studies for us?

1 MR. WEBER: You know, it escapes me now, but I can
2 come up with the references, but in order to come at least
3 even with the 1,100 that is permitted, we have to be able to
4 capture permanently 55 percent of the 90 percent that is
5 captured, so we capture from the source, we capture 90
6 percent, that leaves us with 10 percent. But compared to
7 the 1,100, that's actually 20 percent of the 1,100 limit, so
8 we have to be able to store permanently 55 percent to be
9 even; instead, we haven't achieved anything, we haven't
10 achieved the goal that we are claiming that we want to
11 achieve, which is cleaning the atmosphere, or cleaning the
12 air of the greenhouse gas. No, we are maintaining the
13 levels and, actually, if we want to produce more power that
14 means that we are even increasing the levels in the
15 atmosphere. So, the premise is that, you know, the way I
16 understand it, and the way it has always been presented, is
17 that this is a technology that will reduce a lot of the
18 carbon that is in the atmosphere, which is the greenhouse
19 gas, no doubt about that, but it's not reducing it, no, it's
20 just - it's just allowing others to produce more carbon and
21 to deal with that excess that's produced.

22 MR. BAUER: Okay, I'm going to have to stop because
23 I have to see if I have other comments. But thank you very
24 much for sharing your comment and also engaging in the
25 discussion.

1 MR. WEBER: Thank you.

2 MR. BAUER: John, do we have a call on the line?

3 JOHN: No.

4 MR. BAUER: Okay, I couldn't tell because it doesn't
5 show up here. Okay, do we have any other comments? Any
6 other comments from the floor? And if there are any callers
7 who would like to call in, we'll give it two more minutes
8 and then we're going to move on in the agenda. All right, I
9 read off the kind of areas of discussion and the Panel
10 members have a copy of those items I read off, and if
11 anybody on the Panel would like to begin to pick up one of
12 the areas and we could start to engage in discussing the
13 potential --

14 MR. MURRAY: This is Kevin Murray. I apologize, I
15 keep forgetting to do that. With regard to regulation and
16 permitting, sort of just taking these, you know, down the
17 line, I'm of the opinion that we should attempt as much as
18 possible to recommend proscription of what the regulatory
19 framework should be. I think the bodies to whom we report
20 and the Legislature will decide whether they want to do
21 that, but I think we ought to - you know, one stop
22 permitting, which is kind of a buzz word, and we've got to
23 define that in some way, or a streamlining of the permitting
24 process, I think we have some consensus that there ought to
25 be some easy way to coordinate the permitting. Maybe we

1 have - maybe the technical staff could help us with what
2 that actually should be to make it streamlined, but I'm off
3 the opinion that we should be as aggressive as we can about
4 proscribing and let our bosses to whom we report decide
5 whether they want to follow-up on that. But it seems like -
6 you know, to the extent that today we're driving consensus,
7 again, we all kind of agree that there needs to be some
8 streamlining of the regulatory framework because we have
9 presentations about the Byzantine ways that different
10 agencies have control over this, and some agencies are
11 interested in participating, and some not. So, my thought
12 is we ought to pick a lead agency and suggest that we
13 proscribe to that agency as the lead agency, and formulate
14 some coordinating policies based upon that. I don't know
15 what the lead agency should be, and I'm happy to kind of
16 take the assessment of the more knowledgeable colleagues
17 here on what it should be, but we should proscribe
18 something.

19 MS. REHEIS BOYD: And just as a follow-up to that, I
20 know we've thrown up some different ideas, right, and one of
21 those was just, no matter who we would pick as a lead, that
22 we make sure that the responsible agencies still hold their
23 core expertise, so DOGGR would continue to do down-hole,
24 Water Board would do what their issue - I mean, Air would be
25 handled - I mean, all of those would still be within the

1 purview of the agency, but having some oversight, or not
2 even oversight, more of a coordinating element like the
3 power plants have the luxury right now with the Energy
4 Commission doing that for power plants, nobody else really
5 has that, right? I mean, the rest of us are sort of out
6 there trying to figure out how we get through the maze. So,
7 I agree, as much of a recommendation as we can give, the
8 better, otherwise it'll just keep floundering where it is.

9 MR. RUBIN: Carl, let me make - I absolutely agree
10 with Kevin, we had some specific discussions of this in a
11 teleconference, I thought we were getting close to very
12 strong consensus on that, but let me just back up a little
13 bit in terms of this list and make perhaps a more general
14 comment, you tell me whether it's helpful, and that has to
15 do with prioritizing and organizing this list. So, I think
16 it's very important that our product be targeted and as
17 concise as possible, and say something about priorities,
18 which often get lost in long lists of things to do and a lot
19 of the useful suggestions. But, I believe some things are
20 just much more important than others and that message needs
21 to be clear. So, I would take this list, there are a couple
22 things I would probably add to it, and reorganize it. And
23 I've got basically kind of four bullets, and I would suggest
24 these are the priorities. The first has to do with the
25 regulatory framework for permitting CCS projects. The

1 question is why in California today would anybody undertake
2 a CCS project. I think there is one good reason and another
3 possible reason. The good reason is 1368, that establishes
4 a requirement to do CCS if you're going to exceed that
5 standard of 1,100 pounds per megawatt hour. So, there is a
6 performance standard on the books and that is one compelling
7 reason that certain projects might want to undertake a CCS
8 project. The other is AB 32 and that's less compelling
9 today because CCS is a 80 or 90 percent reduction technology
10 if used fully. That requirement, that level of reduction,
11 doesn't really kick in until the post 2020 period, so there
12 is less urgency, I would argue, for someone to start today
13 to do a CCS project in order to comply with the State
14 standard, although we note that it will be coming. And so
15 that, to my mind, sets up the following priorities for the
16 things we need to talk about. So, at the top of my list is
17 the regulatory framework for permitting CCS, a CCS project,
18 you can't do one today, clearly, and I agree with Kevin's
19 notion of having as streamlined a process as possible, but I
20 want to first talk about the attributes to make sure we
21 don't miss anything. So, the issue of permitting a CO₂
22 pipeline, I would say, is a subset of that. So, a number of
23 the issues, Carl, that you have on this list I think are
24 subsets of others. In order to permit a CCS project, if it
25 requires a pipeline, you also need a process for regulating

1 and permitting the pipeline. You wouldn't necessarily do a
2 pipeline independent of a CCS project. So, let me start
3 there. Obviously, you've got to permit the capture
4 facility, as well, but I think that is pretty well taken
5 care of by existing policy.

6 MR. MURRAY: Sorry to interrupt you, but do we agree
7 as a Panel that the projects themselves get kind of taken
8 care of by themselves, separate and apart from the pipeline?

9 MR. RUBIN: The capture point?

10 MR. MURRAY: Yes.

11 MR. RUBIN: I'd be happy to put it on the list.
12 Actually, we should probably - actually, you're right, I
13 mean, just to be complete, the CCS project has to start with
14 the capture. We need to say something about it, but in
15 terms of a new action, I suspect it's less compelling. So,
16 yeah, you have to have clearly established policies and
17 procedures for installing the capture system. You've got to
18 have requirements to permit SU2 pipeline if one is needed,
19 as it often might be. And then, at the sequestration site,
20 there are a number of things that have to be done. You have
21 got to have requirements for site selection, and I would
22 argue that the environmental justice item here is tied very
23 strongly to that criterion. Requirements for site
24 selection, so they're both physical and geological, but
25 they're also social in some ways. Requirements for MMV, or

1 whatever acronym you prefer, Monitoring, Measuring and
2 Verification requirements for operation are, again, parts of
3 what are required there, and we need to figure out the best
4 way to do that. So, I would put that lump of issues at the
5 top of the list of urgency. The second item I would have
6 would be - and it's not on this list, but it's critical - is
7 greenhouse gas accounting under AB 32, in a way that allows
8 CCS to be a player. Again, we've heard from a variety of
9 white papers and previous testimony that today those
10 requirements are not clear. And in the long term, that is
11 probably the most important, but I would put it today
12 slightly behind the regulatory framework. We need clear
13 accounting rules to make sure CCS can be a player, and they
14 need to be consistent with the regulatory framework. The
15 third issue in priorities I would put would be the
16 incentives for early projects and policies to undertake
17 early projects. Part of that might be the pore space issue.
18 Absent anything - if we say nothing, the pore space issue
19 presumably would be handled under existing law and maybe
20 that's perfectly adequate, but we'd have to decide whether
21 we want to say anything, whether doing something particular
22 about pore space would be something that would be helpful to
23 provide incentives or facilitate these projects. And then,
24 the fourth major item I'd put would be public outreach. And
25 after listening to David this morning, I think we would want

1 to be explicit that the public includes not only citizens
2 that have an interest in these things, but a lot of the
3 industrial folks who have commercial interests and perhaps
4 also need to get educated about some aspects of CCS that
5 perhaps they have less familiarity with. So, I would
6 suggest that as a structure for the report that we produce.
7 We still have to get to the nitty gritty of what exactly we
8 want to say in each of these areas.

9 MR. BAUER: Well, I will see if the Panel members
10 want to respond in any way, or just accept? I will explain
11 why I put down even more granularity on this - or did you
12 want to sweep together as just a CCS discussion, which
13 basically because of previous meetings and discussions, and
14 the white papers, and the outline of the report, had in fact
15 broke them out because there are different laws and areas of
16 law that are involved in each one, for clarification. So,
17 while CCS stands for Carbon Capture and Storage, and it is
18 one entity, you can't do any credit if you can't store what
19 you've captured. The rules around pipelines are under a
20 different set of requirements, as capture would be under the
21 permitting of a plan, and ARB has come out with the
22 monitoring verification requirements for the emissions, and
23 yet those who have to permit the sequestration want to come
24 up with a different MMV plan about leakage management, so
25 that's why I broke it out. I don't disagree that maybe

1 under a subset, we probably have to give some fairly clear
2 guidance under each one under that subset.

3 MR. RUBIN: I don't disagree at all. I think
4 talking about them in a logical, coherent structure makes it
5 a little more transparent to people who are new to this
6 area, and we don't leave any of the bases uncovered.

7 MR. KING: This is John. Just kind of reacting a
8 little bit to a couple of things, I think I wouldn't
9 underestimate the importance of clarity and ownership of
10 pore space. As you said, there are existing laws, but these
11 are not definitive in terms of ownership and, so, what we
12 would basically be saying is project proponents are left to
13 resolve this by litigation, which could take a very long
14 time, and certainly delay projects to an unacceptable level.
15 So, I think having clarity there from a project timeline
16 perspective avoids a lot of headache.

17 MR. RUBIN: Again, I absolutely agree. The question
18 I would start with is why is this panel concerned about pore
19 space, and the answer is that - so, I see it as something
20 that is needed to provide incentives and to facilitate a
21 project, as opposed to a requirement for doing the project,
22 someone to go out and get all the floor space, and then you
23 still need some regulations. I see it a little differently
24 than "what do I need to get the operation going, now that I
25 have my pore space?"

1 MR. BAUER: Well, I think one of the reasons the
2 pore space - this is Carl Bauer - the reason, remember the
3 white paper, and in fact, we have Jerry Fish, and so if the
4 Panel would like to ask him a question, I think you will
5 probably step up and speak, Jerry, would you be willing to?
6 Okay, was the fact that, without clarity of pore space, you
7 wind up with the argument of what has to be done to legally
8 have access, and since it's for a long term, you don't want
9 that argument after you start to inject. And each state
10 varies, and sometimes, what I understand even in California,
11 there is some variation between sectors of the State, so a
12 very large state for a service area. So that would be maybe
13 not what we say has to be done as a recommendation, but a
14 clear recommendation, a clarity must be provided since it
15 doesn't fall under mineral, or oil and gas rules, what does
16 it fall under? Jerry, if you want to add a clarification,
17 just step up to the mic.

18 MR. RUBIN: Yeah. So, again, I could see as a
19 requirement, Carl, for permitting a site, one of the
20 requirements must be that the Applicant must demonstrate
21 that they have legal ownership to the pore space they intend
22 to use. That would be a requirement to permit. How you get
23 that is a whole separate issue, obviously very critical;
24 there is not a way of doing that easily. All the
25 regulations and requirements for permitting in the world

1 ain't going to lead to a project, so I am certainly not
2 underestimating the importance of it. Just in terms of
3 structure, just in terms of explaining the context for the
4 various pieces of things that we will talk about, those
5 contexts are a bit different, I believe.

6 MR. BAUER: Well, this is maybe a parenthetical
7 statement - this is Carl Bauer - is that we have different
8 kinds of recommendations that may come forward. One
9 recommendation may be that clarity needs to be arrived at
10 without a way of doing it from this particular Panel's
11 ability, where we are right now. Another may be even a
12 legislative action needs to be taken, and even something
13 that would be at least a content of what that action must
14 be, and then in some areas you might recommend a regulation,
15 a study, so some areas will be proscriptive, some areas will
16 be a little more by way of intent, but I'd like to let Jerry
17 give us a little insight by way of example on the pore space
18 discussion.

19 MR. FISH: Thank you. Jerry Fish. I actually think
20 that there are two, as Ed has mentioned, two really
21 important aspects of pore space if we want the projects to
22 move forward, one is it is helpful, but not dispositive, to
23 have some legislative clarity saying, you know, as a rule in
24 California, the service owner owns a pore space. I think
25 you'd get there anyway, and I also think it's true that

1 enacting a statute like that doesn't eliminate the
2 possibility for litigation, of course, because some of the
3 deeds that you'll be looking at pre-date the legislation.
4 Having said that, I think the more important issue with
5 respect to pore space is the issue of what do you do - and I
6 think the private market, for instance, is going to be very
7 effective at aggregating pore space. I understand there are
8 other approaches, but I actually think they'll be very
9 effective. But there will be your circumstances where it
10 will be necessary to figure out, what do we do with the
11 holes in the doughnut? What do we do with folks that didn't
12 want to sign an easement, or take any amount of money to
13 involve their pore space in a project? I think some
14 consideration for either a unitization approach as Montana,
15 or Wyoming, or Dakota have done, or some back-up eminent
16 domain authority, as Louisiana has done, will be critical
17 because most of these projects at commercial scale will be
18 big enough that the likelihood that there will be a few
19 people who don't want to participate and there has to be
20 some way to deal with that, just as with pipelines. Again,
21 that's one of the more important issues with pipelines. The
22 regulation for safety is there, but how do you acquire the
23 right of way? In any pipeline of any length, you've got to
24 have an authority to acquire the right of way, and we don't
25 have that yet for CO₂, necessarily. Utilities may have it

1 currently as part of their broader authority, but other
2 folks won't. But I think that unitization or eminent domain
3 issue is one that would be pretty critical to have a
4 recommendation on.

5 MR. MURRAY: Kevin Murray. I like the idea, I mean,
6 we think the common law baseline is that the surface owner
7 owns the pore space.

8 MR. FISH: Yes.

9 MR. MURRAY: It seems to me the more complicated
10 issue is where someone, you know, particularly in EOR,
11 someone has the right to extract and the question is whether
12 they have the right to inject permanently as opposed to
13 temporarily. That seems to be the thornier issue in the
14 shorter term than even sort of the basic idea that the
15 surface owner owns the pore space. Or, I mean, do you
16 disagree with that?

17 MR. FISH: I actually do to a certain extent. I
18 don't think it's thorny at all, as long as an EOR project is
19 continuing to extract hydrocarbons and paying quantities --

20 MR. MURRAY: Well, I think they can inject. I
21 certainly argue and agree that they can inject, the question
22 is can they cap and store.

23 MR. FISH: To the extent that they - I mean, I think
24 it's pretty clear today, and it goes on in several states,
25 including California, where they do water flood, you know,

1 when they put in salt water, for instance, to produce more
2 oil, they can leave it there. And likewise, in states where
3 they're injecting CO₂ to recover more oil, they can leave it
4 there, it's probably a good idea.

5 MR. MURRAY: You don't draw a distinction between
6 leaving it there and, for commercial benefit, storing and
7 making sure that it stays there? You know, if you inject
8 some water and the water just happens to stay there, that to
9 me is different than if you inject something and say, "I am
10 permanently storing this here and, by the way, I've gotten
11 some economic benefit for permanently storing this here."

12 MR. FISH: I don't make that distinction and I would
13 give us an example, for instance, with respect to a
14 goldmine, the tailings impoundment, there's a regulatory
15 requirement that you impound the tailings and store them
16 there forever, that's all part of the property rights that
17 the mineral owner has in terms of mining, they're going to
18 have to do whatever the regulatory agency says in terms of
19 protection of the environment. It's all part of the package
20 of the oil and gas rights, and I really don't think it's
21 much of an issue with respect to carbon dioxide injection
22 for so long as production goes on. I think it only becomes
23 an issue if, after finishing an EOR project, somebody says,
24 "You know, we could probably pump more carbon dioxide in for
25 another 20 years and get more carbon sequestration."

1 MR. MURRAY: But you don't think, as long as
2 operating EOR for however long you operate it, and then
3 you're through, and you cap and leave, you don't think
4 that's a problem? You only think it's a problem if you are
5 not doing EOR, and then you - in theory, you don't have the
6 right to do anything under the surface -

7 MR. FISH: Right.

8 MR. MURRAY: -- after your production project is
9 over.

10 MR. FISH: Not under your oil and gas leases, right.

11 MR. BAUER: We have a comment call in, so, Jerry,
12 thank you very much.

13 MR. MURRAY: Thanks, Jerry.

14 MR. BAUER: Please put through the caller.

15 MR. GAZI: Hi. Nima Gazi calling in here from
16 Alberta, Canada. I have a question to the panel -

17 MR. BAUER: Could you speak up, please?

18 MR. GAZI: Yeah. Can you hear me now? Hello, can
19 you hear me, please?

20 MR. BAUER: Yes, we can hear you now, thank you.

21 MR. GAZI: Okay, great. Nima Gazi calling from
22 Edmonton in Alberta, Canada. I am a Pipeline Engineer and
23 CO₂ pipeline researcher. My question to the panel is with
24 respect to minimizing time of deployment and execution of
25 the pilot project. I'm wondering if there are any

1 technological or regulatory collaboration at the
2 international level happening, at least between U.S. and
3 Canada and the UK. We just concluded a CO₂ pipeline panel at
4 the end of September here in Calgary, and we could see a lot
5 of people, different parts of the world, including Australia
6 and UK going after the very similar technological and
7 regulatory issues, in parallel, which kind of to some extent
8 looks like maybe a waste of resources vs. if there was an
9 international collaboration happening, things could have
10 been speeding up. I'd like to get your comments on that,
11 please.

12 MR. BAUER: So, if I understand your comment, this
13 is Carl Bauer, your recommendation would be that some
14 international discussion around pipeline regulations for CO₂
15 would be beneficial. Is that fair?

16 MR. GAZI: Yes, but in a - at the larger scope, CCS
17 in general, because there is a lot of regulatory concern, or
18 missing regulation, that different states are looking to
19 develop in parallel, whereas many of the issues are
20 basically in common. I'm just wondering if there are any
21 basically interstate collaboration, or international
22 collaborations going on that I might now know.

23 MS. REHEIS BOYD: Yeah, and previously, Darian,
24 maybe you can - oh, Cathy Reheis Boyd - maybe you can help
25 us. I saw in one of your recommendations that you at the

1 Department of Energy felt it was very important that we do
2 this on an international collaborative basis. Is that
3 something you're recommending because it needs to happen?
4 Or has it started? Or are we just sort of agreeing with
5 this gentleman from Canada that it is essential?

6 MR. GHORBI: This is Darian Ghorbi from Department
7 of Energy. I think that the DOE and the United States
8 Government generally has been involved in many international
9 collaborations, for example, the CSLF, the IA Greenhouse Gas
10 Program, and these groups have come up with specific
11 recommendations on a variety of issues relating to CCS, and
12 I think that our position was that the task force was
13 dealing with mostly domestic issues because of the complex
14 legal nature of a lot of the processes that want to go on,
15 but we didn't want to ignore the fact that, you know,
16 meeting global climate emissions targets is something that
17 CCS is going to be used worldwide, and we wanted to not say
18 that, you know, we want to develop this in a vacuum
19 domestically, that collaboration among states with their own
20 unique domestic legal challenges is something that should be
21 worked on together.

22 MR. RUBIN: Carl, I can mention - this is Ed Rubin -
23 to our colleague in Alberta, probably the most highly
24 subscribed international effort of this sort that I'm aware
25 of is one that has been underway through the international

1 energy agency in Paris for well over a year, probably closer
2 to two years, and I'm sure the website has a lot of detail
3 on this. They've been running a number of regular seminars,
4 reports, and have developed a fairly large body of
5 information that is trying to do some of what you suggest.
6 Inevitably, of course, both national and within countries
7 regional, issues come up, but that's one of the larger
8 efforts that has been going on for some time. You might
9 want to check that one out, as well.

10 MR. GAZI: Thank you very much.

11 MR. BAUER: Thank you for your call. Are there any
12 other calls, John? Okay, just raise your hand if there's
13 something so I can recognize that we have to - going back
14 now to the pore space discussion a little bit, and I think
15 we want to reserve the comments on the CO₂ pipeline for when
16 we talk about that topic. Let's try to come in the next 15
17 minutes to a little more discussion on the pore space before
18 we break for lunch, and what their recommendation might be.
19 Let's head towards that. George?

20 MR. PERIDAS: Yeah, let me begin by trying to
21 summarize where we are and then suggest a way forward. I
22 think that the situation right now - and, Jerry, interject
23 if I get something wrong - is that the ownership of pore
24 space is pretty clearly defined for common law, it wouldn't
25 hurt to clarify it further, but it's not necessary. And

1 that means that the pore space ownership is tied into the
2 surface estate, which would apply if you wanted to do a
3 saline injection; if you wanted to do an injection in
4 conjunction with recovery, then you don't need to worry
5 about pore space ownership, as long as you still are
6 effectively producing oil and gas, because your oil and gas
7 lease takes care of that. When that production ends, then
8 your oil and gas lease doesn't cover you anymore, and you
9 either need to start thinking about pore space, which I
10 think is a pretty likely scenario, the injector already
11 owned the pore space in the first place. I can think of a
12 case where this is true, I can think of a case where it
13 might not be true. But, in any case, you could still choose
14 to acquire the ownership at the beginning. Now, the
15 question then becomes how do you acquire this pore space;
16 right now, it has to be done the long way, which means going
17 and negotiating with individual landowners one-by-one and
18 getting consensus, and we don't have a mechanism where we
19 can pool those rights in an efficient - not efficient - in a
20 quicker and less time consuming, resource consuming way. I
21 think we have to be careful here. I think we do have an
22 issue that needs to be clarified and resolved, the question
23 is how. And there's a heavy handed way and there is a less
24 heavy handed way. In a common constrained well, ideally the
25 people would see pore space as a resource on which they're

1 sitting on, like oil and gas, and that has a value. I think
2 some people will see that, some won't. Some people will see
3 it as an invasion into their property and their rights, and
4 then saying, "Okay, someone is trying to make me give up my
5 land and my ownership rights in order to stuff a whole bunch
6 of waste which they might regard as hazardous," even though
7 we might have a different opinion. And that's the main
8 reason why I would point away from something heavy handed
9 light eminent domain. I would suggest a process here, not
10 necessarily a recommendation at this stage, that the state
11 legislate straight away that we need mandatory unitization,
12 for example. But I think there needs to be a process
13 whereby the main stakeholders are invited to consider the
14 benefits and the risks of this thing, and then collectively
15 give rise to recommendation which will already have buy-in,
16 so what I'm suggesting here is that we don't shortcut the
17 conclusion, but actually invite some landowners, invite
18 interested stakeholder groups, to be presented with the
19 facts about sequestration, about the potential value of this
20 resource on which they might be sitting, and then try and
21 come up with a recommendation through a maybe stake
22 [inaudible] process that will choose the most popular
23 approach.

24 MR. MURRAY: This is Kevin Murray -

25 MR. PERIDAS: And, Kevin, one more thing. I don't

1 think of it as just the question of acquiring the rights, I
2 think the issue of just compensation for the use of those
3 rights needs to go hand in hand.

4 MR. MURRAY: I sort of am a little bit loathe to
5 start inserting ourselves into property ownership issues
6 because, as you mentioned, people tend to take them more
7 emotionally than even factually. And I guess I have a
8 question for my colleagues up here, or anyone in the
9 audience, of the first handful of these projects, is
10 acquiring pore space really an issue? For instance, if the
11 first handful of them is going to be mostly EOR projects,
12 then pore space is not really an issue. So that's my kind
13 of question on a practical basis, and I don't know if
14 anybody has an answer to that because I agree that pore
15 space is problematic, but the emotional idea of, you know,
16 essentially changing someone's property rights, or even
17 their ill formed belief of what their property rights are,
18 just is an uphill battle, so I don't want to do that if we
19 don't have to, at least with these first handful of
20 projects. And then the other thing I think is that, if it
21 so happens that, in the first handful of projects, pore
22 space is not really an issue, then once those are going, the
23 next few projects, people will have a lot more confidence in
24 the entire thing, and you can deal with pore space later.

25 MR. KING: So, this is John and we both have seen

1 the list of projects which all involve EOR for spending of
2 the stimulus money. There is one saline project. And
3 that's outside of California, as well. I think you do need
4 to be careful to make a decision based on what people are
5 choosing to do, given the current regulatory framework
6 because it's a bit of a self-fulfilling prophecy. So, we
7 may not be getting the ideal or desirable mix of projects
8 which would probably have saline, as well as EOR, because
9 that clarity is lacking. So, just to say, okay, we'll avoid
10 that question because the early wave of projects are showing
11 a way is a bit of a - there's a bit of a circle there,
12 Kevin, that I think you see.

13 MR. MURRAY: I think that's a great point and I'm
14 sort of struggling with it because I also think that, on the
15 same basis that it becomes a self-fulfilling prophecy, it's
16 also possible that dealing with these property rights issues
17 sort of drags the whole thing down because I think, as
18 George pointed out, clearly, I think people either do two
19 things, they start acting emotionally, or we've all seen
20 instances where they don't act emotionally, and they're
21 certainly willing to sell their pore space rights, but they
22 have a completely unrealistic idea of how much it's worth.

23 MR. RUBIN: Kevin, I'm inclined to agree with you,
24 and that was the reason for my prioritization in terms of
25 this list of things we have, I do not think that is at the

1 top of our list for precisely that reason, and it's for that
2 reason that I think the proper place to discuss the role of
3 pore space is under the heading of incentives and policy
4 drivers for large - here's the key - large scale deployment
5 of CCS. I think, for those initial handful, small number of
6 projects, from what I've been able to see in California,
7 it's not the rate limiting step at all. It could well be a
8 rate limiting step if one envisions CCS playing a major role
9 in reducing greenhouse gas emissions in the post-2020
10 period, and there at the very least issues of unitization
11 and eminent domain. Without those things -- we spent the
12 last two years on that CCS Reg project working with a lot of
13 lawyers, working through all these scenarios -- there are
14 just an incredible number of ways to bring CCS to a dead
15 halt under the current legal system we have. Our conclusion
16 was that it really needed a Federal approach if CCS is going
17 to be a major player nationally, but we're nowhere near
18 there yet and it is certainly not something that California
19 would do. So, I would put that further down the list. It
20 would be something I think we ought to stay away from in
21 this first round, but flag it as an issue that, once we get
22 past - if and when we get past these initial handful of
23 successful demonstrations - it will be an issue that will
24 need to be addressed more forcefully.

25 MR. BAUER: Okay, appreciate it, Ed. I'd like to

1 use this time we've got on this subject to finish it. I
2 think Jerry has a clarifying thing if you could wait,
3 George?

4 MR. MURRAY: Jerry, you should just be up here.

5 MR. FISH: I appreciate it. Jerry Fish from the
6 Technical Advisory Team. I agree with Ed that the initial
7 projects that are injecting 10,000, 100,000 tons of CO₂ to
8 see if it works, pore space acquisition will not be the
9 limiting factor. But I think it's pretty clear with respect
10 to saline formation projects that pore space acquisition is
11 a limiting factor, will not be possible to have commercial
12 size projects without some mechanism. So you can decide to
13 wait, to put it off until, you know, some more Phase II or
14 Phase I projects have occurred, but you can't really enable
15 saline project unless you have a pore space acquisition -

16 MS. REHEIS BOYD: But, Jerry, it seems like, I mean,
17 a lot of these things take a while to talk about and develop
18 and I think, if I understood what George was suggesting, is
19 that we could certainly recommend a process where we just
20 don't kick the can down the road, that we actually invite
21 discussion now, because it's going to be an issue -

22 MR. FISH: Absolutely.

23 MS. REHEIS BOYD: -- if we actually get to some
24 serious deployment, it will be an issue. So I certainly - I
25 think there is some merit in considering what George was

1 suggesting.

2 MR. KING: Well, I think - this is John - I think
3 there's kind of two pieces, one is easy, which is clarifying
4 who owns the - that the surface owner owns it, that is not a
5 real emotional sort of thing -

6 MR. MURRAY: I would disagree, because once you make
7 that statement, every surface owner who thinks he might be
8 in line for pore space is going to aggressively pursue more
9 compensation than it's worth, so those kinds of statements,
10 while logical among people that think logically, are not
11 necessarily treated that way by property owners. So I
12 disagree that that's an innocuous statement because it will
13 generate a reaction.

14 MR. BAUER: I think George has a comment.

15 MR. PERIDAS: Yeah, in answer to Kevin's previous
16 question, I think it's going to be a mix of things. I don't
17 know if Elliott is still in the room, but in Oxy's case, in
18 Elk Hills, you know, they own the land and the pore space,
19 and that's not going to be an issue. And the project that
20 John was trying to develop, it definitely was going to be an
21 issue because he needed to go and consult with every
22 landowner that would be above your footprint, and I think
23 some of the WESTCARB projects have actually run into the
24 same procedure, they have to go and negotiate with every
25 single owner.

1 MR. BAUER: I will just acknowledge, though, the
2 technical director of WESTCARB is nodding yes, that's
3 correct.

4 MR. PERIDAS: The point I was trying to make is
5 there could be a range of reactions here and I don't think
6 that any of us are wise enough to project - I don't think I
7 am - to project what they're going to be. I think there are
8 going to be some people who say "no way, I don't want you
9 injecting that stuff under my land," and there will be some
10 who say, "Oh, I like this idea. Why is the other guy
11 holding me up?" But I think, before we jump to what the
12 solution should be here, we should solicit input from all
13 the interested parties. You know, we are not those parties,
14 we should consult with the actual landowners and see if
15 there are any groups and lobbies that want to weigh into
16 this because I'm almost 90 plus percent sure that none of
17 them have even thought about this yet.

18 MR. MURRAY: This is Kevin Murray again. If I could
19 channel Carl a little bit and try to synthesize this down to
20 some consensus for recommendation, we all agree that pore
21 space is an issue. There are some of us who probably would
22 be more aggressive about determining what those rights are
23 and some less, but George kind of suggested a third way,
24 which is not necessarily to proscribe what the pore space
25 rules are; but, what we could do as a recommendation is, a)

1 identify it as a significant issue, and b) proscribe a
2 process for some rules to be developed on the pore space
3 issues, and everybody seems to be nodding their heads, so
4 maybe that is some consensus on one of the recommendations,
5 somewhat the way George described.

6 MS. REHEIS BOYD: And I think the process has to
7 include, as George said, the actual stakeholders who are the
8 landowners, as well.

9 MR. MURRAY: And so I would go further, and when I
10 say "proscribe that process," I mean proscribe that process,
11 you know, some agencies shall hold hearings and develop
12 regulations, or regulatory framework for pore space
13 ownership, rather than leave it more open.

14 MR. PERIDAS: Well, with one nuance here, we should
15 not necessarily pre-judge that the outcome will be new
16 rules.

17 MR. MURRAY: Exactly.

18 MR. PERIDAS: The conclusion could be that we keep
19 the status quo in order to minimize uprising and damage.

20 MR. MURRAY: The phrasing escapes me now, but I
21 absolutely agree with that concept.

22 MR. BAUER: Well, we appreciate you volunteering to
23 think about the phrasing, Kevin. And since we've
24 circumvented Ed's strong recommendation for a
25 prioritization, we let him pick the first other

1 recommendation after lunch. George, you've got one more?

2 He likes to have the last word, you might note.

3 MR. PERIDAS: In response to what Ed said before, I
4 think he suggested a Federal solution to the pore space
5 issue?

6 MR. RUBIN: I am saying that that is conceivably one
7 option.

8 MR. PERIDAS: But almost by definition, we will need
9 to deal with this --

10 MR. RUBIN: Probably not likely --

11 MR. PERIDAS: -- on a state by state basis. That's
12 my -

13 MR. RUBIN: I understand.

14 MR. BAUER: Okay, so we're going to break for lunch
15 and I've got a peanut gallery hand up here.

16 MR. SURLES: Terry Surles, Technical Advisory Team.
17 I would just like to ask the members of the Technical
18 Advisory Team that are here to stay around for a few minutes
19 as people break for lunch.

20 MR. BAUER: All right, we're going to break for
21 lunch and start again at 1:00. Ed, I'd like you to think
22 about it and we can talk at lunch quickly, which topic you'd
23 like to tee off with at 1:00. Thank you. Thank you, all.
24 Thank you, callers.

25 (Off the record at 12:01 p.m.)

1 (Back on the record at 1:02 p.m.)

2 MR. BAUER: We'll reconvene the Carbon Capture and
3 Storage Review Panel. We're working through potential
4 recommendations amongst the panel members. And one member
5 will be a few minutes late, but we're going to start in
6 advance. So, I've promised Ed Rubin, I asked him to open up
7 with his number one priority of possible recommendations,
8 so, Ed, I'll turn it over to you.

9 MR. RUBIN: Thank you, Carl. Let the record show
10 that that's because I'm the smallest target and I have 10
11 years, so you can't fire me. So let me revisit the notion
12 or priorities that I was floating earlier this morning. The
13 top of that list is developing a regulatory framework for
14 permitting CCS operations, both because they may be required
15 under 1368 for power plants, but more generally across a
16 variety of sources in the State, as a potentially critical
17 measure for achieving the goals of AB 32 and large scale CO₂
18 emission reductions. I think I've learned a lot over these
19 last couple of meetings about processes in California. They
20 are a lot more fragmented than I would have guessed, had I
21 not known this, it seems to be working. I can't help but
22 believe that, in certain dimensions, there could be better
23 efficiencies and competence to deal with some of these
24 issues in ways that could help achieve the objectives that
25 the panel has been asked to do, and bring CCS on more

1 quickly. So, the essence of what I've been thinking about
2 and will suggest is that, from my point of view, it would be
3 beneficial and desirable if there were one lead agency in
4 the State where anybody with a CCS project, not just a power
5 plant, but a refinery, or any other type of facility, could
6 go to propose the project and either carry out or certainly
7 coordinate the process. And to me, the agency that makes
8 the most sense to do that is the Energy Commission. So, a
9 suggestion to consider for the panel is that we recommend
10 that the California Energy Commission be named as the lead
11 agency for CCS projects in any industrial domain, maybe
12 there might be a size above which, or below which, some
13 other agency might handle something like that, but I think
14 that's fine tuning it, but basically to name the CEC as the
15 coordinating agency - as at least the coordinating agency,
16 and potentially the sole regulator, but that would require
17 changes in State law to do that, and other agencies - DOGGR
18 and other agencies - conservation - that have critical roles
19 to play in that process retain and exercise their expertise
20 and competence, but the one stop, the first stop, and maybe
21 last stop, be the Energy Commission, which would be
22 responsible for handling the coordination that would be
23 required among various State agencies to determine whether
24 the yet to be specified conditions for permitting a CCS
25 operation have been adequately satisfied. I think that's

1 the essence of the recommendation. So, it's basically - so
2 I would characterize this as a procedural recommendation,
3 that is a recommendation to establish procedures for
4 permitting CCS operations. Within that, my own sense is
5 that it would be helpful if our panel also made other
6 recommendations or guidelines as to the nature of those
7 requirements, for example, things like MMV or even site
8 selection, and I have some thoughts on that I would be happy
9 to suggest, but I'll keep that as a separate proposal right
10 now, and ask for your reactions to that proposal - to the
11 proposal that CEC be the lead agency for doing this across
12 the State.

13 MS. REHEIS BOYD: Cathy Reheis Boyd. I think,
14 generally, Ed, that having that oversight role is what we've
15 discussed earlier, important because anyone who tries to
16 permit anything in this State, it is a regulatory maze that
17 is difficult to get through without having someone who takes
18 the lead, so I think your idea of establishing the Energy
19 Commission as the lead agency is a good one in this sort of
20 oversight role. I do think it is important, as you said, in
21 the next sort of subset of that, that we be pretty clear
22 that the CEC should rely on the expertise of these various
23 entities, and we should specify what that is as a
24 suggestion, for instance, for subsurface issues, clarifying
25 that the California Division of Oil and Gas and Geothermal

1 Resources is the agency that the CEC should rely on for that
2 expertise, I think, is very important, as it is to suggest
3 that the California Air Resources Board should be relied on
4 for their greenhouse gas accounting and measurement, as it
5 may be for the State Fire Marshal to be relied on, whoever
6 we specify. But I think we should be very clear, if there
7 is an agency, sort of this one-stop-shop idea is good, but
8 we should be very clear that the expertise held by the
9 current agencies, in my case, particularly the Division of
10 Oil and Gas that I'm interested in, that that be spelled out
11 as being a very critical element of that process.

12 MR. PERIDAS: George Peridas. I would like to
13 explore this a little bit further. I think for power
14 plants, we already have a situation whereby the CEC is the
15 lead umbrella agency and they are obliged within 12 months
16 to make a decision, and this is because it has been deemed
17 that they have the statutory authority to do this, and it
18 has been deemed that power generation is in the public
19 interest in the State of California. I think, in principle,
20 the recommendation that an agency with the expertise that
21 the CEC has to handle and farm out the different components
22 of the CCS projects sounds attractive, but I'd like to try
23 and explore a little bit further what this could mean for
24 other types of plans, because if we make a uniform
25 recommendation, it won't just apply to power plants, it will

1 apply to ethanol refineries, cement, iron and steel,
2 chemicals, and a number of other things. And some of these
3 plants, CCS, could be a small or a big part of their
4 operation, and I don't want to end up recommending a
5 complete overhaul in how major industrial facilities are
6 permitted in California simply because of the fact that they
7 will be sequestering some CO₂. I think this could have
8 pretty strong implications. I would like to ask Susan for
9 her opinion on this. The way I understand it, CEC within
10 its powers for power plants has to make a decision within a
11 limited amount of time, that is 12 months, and it does have
12 the power to overrule what other agencies might say. So, if
13 we were to recommend that suddenly CEC be in charge, this
14 could mean a pretty major change in how these things are
15 permitted right now. Susan, what do you think?

16 MS. BROWN: This is Susan Brown. I'm a Senior
17 Policy Analyst here at the Commission. I don't disagree
18 with anything you've said, George, with respect to our role,
19 and certainly with power plants sized at 50 megawatts or
20 greater, there is no issue at all since we already have
21 statutory authority for what we've been calling one-stop
22 siting since 1975, and it's worked very - I believe -
23 reasonably well. During that process, we collaborate with
24 all of the responsible permitting agencies and incorporate
25 their performance requirements into our license, and that's

1 the way it works. However, I think if we were to assume
2 that permitting role with respect to refineries, cement
3 plants, or ethanol plants, you would require significant
4 legislative authority that we just currently don't have.
5 It's also conceivable that a Governor could direct the
6 Commission to collaborate and cooperate with other agencies,
7 short of giving us this additional authority. So, I guess
8 in my opinion I see it as sort of a two-stage approach. So,
9 I don't know if I've answered your question, but I didn't
10 find myself disagreeing with anything you've said.

11 MS. REHEIS BOYD: Because, Susan, there are pros and
12 cons, I think, associated with both of those tracks, rights?

13 MS. BROWN: Yes.

14 MS. REHEIS BOYD: I mean, either - I mean,
15 certainly, a collaborating role fits well within the one-
16 stop-shop, everybody retains their -

17 MS. BROWN: Authority.

18 MS. REHEIS BOYD: -- own authority and you're just
19 coordinating.

20 MS. BROWN: Right.

21 MS. REHEIS BOYD: The other one, which is more in
22 the power plant sector, there are some real teeth to the
23 CEC's ability to take action -

24 MS. BROWN: Correct

25 MS. REHEIS BOYD: -- in the best interests of the

1 State of California.

2 MS. BROWN: That is correct, yes.

3 MS. REHEIS BOYD: So it depends on how bold you want
4 to be -

5 MS. BROWN: Right.

6 MS. REHEIS BOYD: -- and how much teeth you want to
7 give, and there are pros and cons to each of those, and you
8 know, if we can't come to some consensus, which who knows
9 whether we can or not, at a minimum we would want to
10 explore, I think, the pros and cons of both of those avenues
11 because they both provide the oversight, one just provides
12 oversight in a coordinating fashion, and the other provides
13 oversight, but with a permitting authority that holds the
14 ultimate decision.

15 MS. BROWN: Correct.

16 MS. REHEIS BOYD: And those are two real different
17 things.

18 MS. BROWN: And those were the kinds of things we
19 tried to outline in the regulatory and permitting paper,
20 that there are in fact tradeoffs between certainty and, you
21 know, using existing authorities and, you know, having some
22 teeth in whatever framework is established that can make it
23 possible to override, say, another permitting agency in the
24 case where two agencies might disagree.

25 MR. PERIDAS: Susan, if there is a disagreement

1 between the CEC and one or the other permitting agencies
2 where a power plant is greater than 50 megawatts, does the
3 CEC hold the final authority to overrule and say this is
4 what the requirement is going to be?

5 MS. BROWN: We have in limited circumstances
6 exercised what we call our "in-lieu permitting authority,"
7 override authority. But it is done very infrequently.
8 Because I would say, in most cases, we've been able to work
9 out any differences in the public forum, so let me give you
10 an example. With respect to Air Quality Management
11 Districts, we require as a condition of our license that a
12 power plant applicant obtain what we call a Determination of
13 Compliance from the Air District, and that is typically
14 worked out within the confines of our permitting process, so
15 that, in the end, it's the equivalent of having a permit
16 from the Air District, but it's called something else, and
17 we use our authority to ensure there is compliance.

18 MR. PERIDAS: Have there been cases where the CEC
19 has had its own opinion about what other agencies should say
20 and in the end impose that?

21 MS. BROWN: Yes, there have been. There have been a
22 couple of instances where the CEC has chosen to - I want to
23 be really clear about this - use its override authority or
24 the threat of its override authority. And in most cases it
25 has been with a local agency, like a City or a County. I

1 can't think of a specific example, but there have been some
2 instances where it's come very close to that. Whether in
3 actuality we use that authority or not, typically in those
4 instances projects don't move forward if they don't have the
5 support of the local land use authority, there are other
6 issues that come forward.

7 MR. PERIDAS: Thank you, Susan. I think this is a
8 good time to take a step back and think, you know, well,
9 what is our mission here as a panel? And I don't think our
10 mission is to try to get as much CO₂ injected underground as
11 possible. I think our mission is to ensure that CCS
12 contributes to climate mitigation, and these are two
13 different stories. If we're talking about making it easier
14 and more robust and more environmentally protective for a
15 facility that's going to get built anyway, like a power
16 plant, to securely store its CO₂ underground, then I see a
17 strong rationale for having a coordinating lead agency like
18 the CEC. If we're talking about overhauling the way that
19 other industrial facilities get permitted, for example, a
20 coal to liquids plant, which might not have been permitted
21 under normal circumstances, which now might become viable
22 under a new permitting regime, under the guise that it will
23 inject some CO₂ underground, that is a very different
24 proposition. And I think we should definitely entertain the
25 options that we are discussing right now. But before we

1 reach a conclusion, we should have a better understanding of
2 what it would mean for the key types of candidate plants
3 here, to have them permitted under such a different regime,
4 because I think we could be looking at a very different
5 permitting pathway, which would elicit potentially strong
6 reactions, both from the proponents and from the opponents.

7 MS. REHEIS BOYD: And, George, I think there's - and
8 I'm not an expert in this area by any means - but I think
9 you can also construct this in a way where you have a lead
10 agency who isn't quasi-judicial, right? I mean, for
11 purposes of power plants in this case, the CEC has a quasi-
12 judicial role, it doesn't mean that under CEQA every other
13 lead agency - there are many that don't, they just serve as
14 a lead agency that coordinate with all the other agencies.

15 MR. PERIDAS: Correct. And there might be a way in
16 which we could phrase a recommendation. I think it's highly
17 advisable to have someone in charge of making sure the CCS
18 chain of custody, from the capture all the way to the
19 permanent storage, is taken care of, and we might not get
20 that if we leave agencies individually to work out their own
21 little piece without an overall CO₂ mitigation perspective.
22 But that's not the same as having an agency that has overall
23 veto authority.

24 MR. BAUER: Let me just - the charge of this panel
25 is to provide recommendations or an observation as to the

1 agencies that chartered us, and to the State, as appropriate
2 through those agencies, on the things that would make it
3 obviously safe and rational, but more efficient, to be able
4 to do CCS where it makes sense to do it. So, going back
5 with what you're suggesting, George, it would be - we could
6 go to a situation, obviously, already legislatively there is
7 permission for CEC with power plants, and so that CCS with
8 the power plant probably could fit within that already, and
9 we don't have to clarify that. If you assume it's part of
10 siting a power plant to be able to do this, then they have
11 to drive through the various subsidiary agencies to get the
12 involvement on a timely manner. For other activities -- and
13 I see Jerry Fish would like to make a comment, we'll do that
14 -- it may be that we want still to have a strong
15 coordinating hand, but maybe not the judicial function, at
16 least until there's a proven need for such a judicial
17 function. But, I mean, our goal is to provide the best
18 information and observations and recommendations to the
19 agencies and to the State, to allow CCS to be a meaningful
20 tool in the toolbox, and to also identify those areas where
21 we see potential obstructions, and some suggestions on how
22 those could be solved. And so I hope that helps get us
23 rephrased on what we're here for.

24 MR. RUBIN: Yeah, just another comment. Our mandate
25 from the three Commissions has two key bullets, the second

1 one says "to support development of a legal/regulatory
2 framework for permitting proposed CCS projects consistent
3 with the State's energy and environmental policy
4 objectives." The latter part, the environmental policy
5 objectives, while the context for CCS is greenhouse gas
6 emissions, the State's environmental policy objectives are
7 much broader than that. My sense is there is more potential
8 for mischief, or different criteria being applied if the
9 responsibility for making these judgments lies across
10 multiple agencies that handle different sources, just based
11 on what California is currently doing now in the area.
12 Ultimately, one has to have trust in the agency that
13 coordinates or authorizes final permitting, that kind of
14 goes with the territory, but I think consistent with what we
15 just heard about the way business has been going on
16 historically, my own comfort level is pretty high that that
17 will be the case. I think there is a lot of precedent and
18 tradition within that agency of not doing things unless
19 other agencies with authority and expertise in various other
20 domains across the spectrum have agreed to do that. So, I'd
21 like to know - and if there is anything that is going to go
22 wrong, we'll be much better able to identify it when there
23 are fewer people involved, and fix or fine-tune anything
24 that needs that. So, I think consistent with our mission
25 here, and given the growing importance of greenhouse gas as

1 part of the environmental policy, which has not been the
2 case up until now, to me, that kind of just makes sense.

3 MR. BAUER: I'd like to Jerry Fish to give us some
4 perspective he has from his legal engagement.

5 MR. FISH: Jerry Fish, Technical Advisory Committee.
6 I wanted to respond to your question, what it might mean if
7 the CEC had authority over projects that aren't energy
8 projects. I think it's a possibility that the CEC or any
9 other agency that were endowed with this authority could
10 kind of draw a line, and so the permitting - the carbon
11 sequestration project is what the agency is concerned with,
12 as opposed to, for instance, the whole pulp and paper mill,
13 or the entire - it doesn't mean that you sneak an oil
14 refinery in under the CEC authority, or a pulp and paper
15 mill, or a concrete plant, but if you're talking about
16 putting a carbon sequestration project in conjunction with
17 it, that's the focus perhaps of the lead agency and it
18 doesn't give them, except for ancillary facilities, the
19 ability to make decisions that counties or other people
20 would otherwise make with respect to the cement plant, or
21 some other feature. That certainly works in our experience
22 in Oregon and Washington, if the scope of the charge is this
23 facility and ancillary features, not everything else that
24 may be around. And in that regard, our energy counsel in
25 Oregon handles geothermal projects. Now, they are energy

1 projects, but they're primarily underground, primarily
2 outside the technical expertise of the agency, the energy
3 agency, and they do rely heavily on the geology agency to
4 provide them with the technical expertise. But, it's really
5 helpful that an agency such as the CEC with the mandate to
6 get infrastructure projects that are in the public interest
7 to the whole state built, or permitted, or considered, at
8 least, in a unified way, it's very helpful to have that
9 authority at that agency, even if they're not the lead in
10 the technical ability.

11 MR. RUBIN: Jerry, while you're standing up, let me
12 ask a question that I wasn't clear about. I think it's
13 clear to me that, if it were the permitting authority, as
14 you have now for power plants, were extended to other types
15 of facilities, I take it that that would require new
16 legislation that the Legislature would have to approve.

17 MR. FISH: Yes.

18 MR. RUBIN: The question is, what if one were to
19 back off and talk more about a coordinating role, or
20 something a little softer than the final buck stops here? I
21 think I heard Susan say that's the kind of thing that might
22 be done administratively?

23 MR. FISH: And Susan can certainly speak to that in
24 California.

25 MR. RUBIN: What would be involved?

1 MR. FISH: We have both models in other states and
2 the coordinating model, while helpful, tends not to cut down
3 the amount of time and I'm just really personally speaking
4 from my experience in these processes.

5 MR. RUBIN: Yeah, it's not my favorite.

6 MR. FISH: They tend to be a place where elephants
7 go to die because nobody has the authority to push the
8 project, everybody is hoping that one of the other agencies
9 will kill it first, and everybody hopes that they get to go
10 last - just to be practical.

11 MR. RUBIN: Right.

12 MR. FISH: And if you have a lead agency who has
13 more of a mandate than a history of actually dealing with
14 getting projects permitted and, you know, because they're in
15 the interest of the State, there is really quite a night and
16 day different in the result, I think.

17 MR. RUBIN: Well, I would expect so - I would hope
18 so. Thanks.

19 MR. PERIDAS: Before you sit down, I have one more
20 question. I'm encouraged to hear what you said, but do you
21 think it would be satisfactory from a permitting point of
22 view to have a facility as large as a refinery, which has
23 hydrogen plants, hydrocrackers, blah, blah, blah, that is
24 permitted under the normal - the currently established route
25 - and then the additional scrubbers or the components of the

1 equipment to remove the CO₂ would be permitted through a
2 different agency?

3 MR. FISH: I think that's a line that you've been
4 talking about already today, it's do you draw the line for
5 the permit for a carbon sequestration facility to include
6 the capture facilities? Maybe, maybe not. It seems to me
7 that maybe it's cleaner to focus on the transport and then
8 the injection and the monitoring and verification as a kind
9 of a ecosystem of a project that you're permitting. And as
10 we do get into the utility side, or the refinery side, then
11 you're looking at the actual capture equipment, it gets a
12 little bit muddier. But, again, I think the phrase that is
13 used in our energy facility siting statute is the facility
14 and ancillary equipment.

15 MS. REHEIS BOYD: So that does include, in that
16 case, it includes the facility itself, the piece of
17 equipment that would go with the -

18 MR. FISH: That might - here, I would think the
19 facility plus ancillary equipment would include the
20 sequestration project, the pipelines, and perhaps the
21 scrubbers and everything, so you could include them, but
22 still not necessarily be making a decision about the -

23 MS. REHEIS BOYD: Yeah, it would not open up, and
24 should not open up, any other permitting obligations of that
25 refinery, or cement plant, or whatever, just because of that

1 CCS project. It should only be with respect to the CCS
2 project itself. And the argument I would make if you go
3 that direction and don't include the facility, then you've
4 just taken - you've just extended the time that it's going
5 to take.

6 MR. KING: Yeah, I think it is important, and maybe
7 this will help to think about it in a way that you will have
8 a first wave of projects that will be kind of soup to nuts -
9 it's John King - and so, for that first wave of projects,
10 you'll have a full value chain from the storage to the
11 transport to the capture equipment, and it would be quite
12 inefficient to try to not execute that project as a single
13 project in a single unit. However, you could envision a
14 future where other facilities may tie in some fashion to
15 that chain that's already been built, that backbone, in
16 which case it becomes much less sort of logical to me for
17 CEC to have sort of oversight of that whole piece,
18 necessarily. And you could see having authority when you
19 have that full value chain and what to be able to put
20 together this very complicated set of permits.

21 MR. RUBIN: The first C in CCS is "capture," so it
22 seems to me that if the objective is to streamline the CCS
23 permitting, I could see the CEC - I'm speculating now - but
24 working in two ways, in the power plant area, because a lot
25 of the projects could be power plants, you already have and

1 will continue to exercise expertise; if it were some other
2 type of facility, there might be facilities that, in fact,
3 are already separating CO₂ as part of their normal operations
4 and are venting it, and they have a relatively small role to
5 compress it. What it would certainly have in common would
6 be anything from the compressor, a pipeline, downstream.
7 The CEC and other industries that it might be less familiar
8 with, I would imagine, could say, "Hey, we don't have the
9 expertise to judge the capture piece for a cement plant," or
10 whatever it is, "we will expect the source to get the same
11 permit they would have otherwise had to get for that piece
12 of it as part of the operation." I presume you could
13 delegate to other parts of the State government
14 responsibility for permitting things, or for approving
15 things, that you don't have technical expertise to judge
16 independently - outside the power industry.

17 MS. BROWN: I just wanted to make a couple of points
18 - Susan Brown again. I think you have to draw the
19 distinction between a CCS technology that's a retrofit to an
20 existing plant, let's take the refinery, for example, you've
21 got a refinery that exists, right? And if you're adding on
22 a CCS project, that's a much different scenario than if
23 you're siting a new refinery. And, Cathy, I know we haven't
24 had a lot of new refineries sited in this State for -

25 MS. REHEIS BOYD: Yeah, in my lifetime, it won't

1 happen.

2 MS. BROWN: -- and you probably aren't going to have
3 any anytime soon, but - right - for a lot of market reasons.

4 MS. REHEIS BOYD: If the CEC was in charge, we
5 probably would.

6 MS. BROWN: We don't want to go there -

7 MR. RUBIN: It could be a new cement plant.

8 MS. BROWN: Right, or our new cement plant. But I
9 guess the other point I wanted to make is I think that, even
10 in the discussion that we're having now about giving the
11 Energy Commission in this example CCS licensing or approval
12 authority that would require a change in law. Right, Jerry?
13 So we're talking about - you could draw it narrowly, but it
14 has to be thought through and I don't believe that, under
15 existing authority, since we're power plant licensing
16 people, that we would be able to -

17 MR. RUBIN: I think that's clear.

18 MS. BROWN: Right, because there are local agencies
19 that have land use authority, there are Air Districts and
20 others that have permitting authority that would need to be
21 adjusted. So, I just wanted to make that point.

22 MS. REHEIS BOYD: Susan, it would seem to - the
23 issue George is raising, which is very legitimate in that
24 you don't want to open up an opportunity to just have a
25 whole new regulatory scheme on any project under the guise

1 of CCS.

2 MS. BROWN: No.

3 MS. REHEIS BOYD: But if a facility is really
4 wanting to do CCS, which is going to be a difficult process,
5 no matter how we structure this, it would seem if you had
6 criteria which specified that the project is for CCS, it's
7 not another project of which a small amount of CCS that
8 you're trying to slide into this faster permitting scenario,
9 but if it's really for CCS, and we're serious about it, then
10 having some kind of an oversight role that provides an
11 opportunity for someone to do start to finish, even if it's
12 an existing facility, to where you're trying to do a core
13 CCS element, to mitigate your climate change impact, having
14 a faster process to do that, that doesn't open the door to
15 any other permitting issue, would seem to be very
16 beneficial. And I can envision that happening under an
17 oversight role, without being even necessarily quasi-
18 judicial.

19 MS. BROWN: What you don't want to do is invite
20 legal challenges - again, I'm practicing law without a
21 license here - you know, for - if we were to, say, assume
22 this oversight role absent specific clarification in the
23 statute, I fear you could invite challenges of our approval
24 process, so that just needs to be thought through, you know,
25 and will likely involve a legislative change. Right?

1 MR. BAUER: Thank you. Yes, John. We have one more
2 person who would like to add from the Technical Advisory
3 Group. Please, John, go ahead, then Ed, if you don't mind.

4 MR. BEYER: I'm John Beyer of Lawrence Berkeley Lab.
5 But I worked at the Energy Commission here in the PIER
6 Program for seven years, and I have what I guess I'm going
7 to regard as an anecdotal observation. While the Energy
8 Commission has this responsibility for authorizing power -
9 thermal power plants of 50 megawatts or greater, my
10 observation was there are a lot of power producers that go
11 to great lengths to develop 49 megawatt power plants, and I
12 truly don't know the reason why. I mean - well, okay, I'd
13 like to hear your comments because, I mean, in concept, it
14 might mean that the Energy Commission is more rigorous, and
15 we would like that rigor. Or, it might be that they have
16 found the process here so cumbersome, it delays their
17 projects, I really don't know which it is, but I think you
18 should look carefully at it before recommending a particular
19 course of action, and what those reasons are as an analogue.
20 Go ahead, I really would like to know why.

21 MS. BROWN: Okay, Susan Brown again. Well, I think
22 we've seen cases where, since our authority is for projects
23 sized at 50 megawatts or greater, that we have seen
24 instances where a developer might size its project
25 conveniently at 48 megawatts to avoid our authority. And in

1 those cases, it's built on the assumption that permitting at
2 the local level, without a State lead agency, is faster,
3 quicker and cheaper. Now, that's sometimes the case and
4 sometimes not the case, I'll just leave it at that. It does
5 happen.

6 MR. BAUER: Okay, George or Ed, do you have another
7 comment?

8 MR. RUBIN: Yeah, the question I was going to ask, I
9 see Kevin is not here, the question was whether we have on
10 the Panel - I'm sure we have on the Technical Advisory
11 Committee - the capability to, for discussion purposes, to
12 draft some of the kind of legislative language changes that
13 would be needed if we were to go that way.

14 MR. BAUER: I think we can get that. If we can get
15 the recommendation we want clarified, we can get the
16 assistance to write the language we might want to have with
17 it. More discussion on this? Or do we think we're at a
18 point of coming to closure. George.

19 MR. PERIDAS: I think we are. I think, from what we
20 heard, we have a path forward whereby we could designate an
21 agency like the CEC to have the overall coordination when it
22 comes to the CO₂ chain of custody, but not necessarily touch
23 the permitting status quo for the bulk of the industrial
24 facility, itself. And we'll be drawing on technical thing
25 to do that, but, you know, just to be clear that this is a

1 point I'm making. And like Cathy confessed, she doesn't
2 foresee any refineries being permitted in California any
3 time soon, and I would hate for this panel to actually
4 provide a pathway for that to happen, sorry, Cathy.

5 MS. REHEIS BOYD: Well, we have existing refineries
6 that will need CCS and offsets to even continue, so this is
7 why it's important, I mean, if - as I said last time, even
8 if we're transitioning into some other low carbon economy,
9 we still have to produce adequate reliable fuels every day,
10 so we need CCS and that opportunity, and to have a process
11 that would allow anyone, a cement plant, a refinery, any
12 other industrial source, to do that as expeditiously as
13 possible, while taking into account all the other
14 environmental protections would be very helpful. So I'm
15 fine with that approach. And, again, one caveat, as I said
16 earlier, again recognizing and stating explicitly that those
17 other agencies who have the expertise that I outlined are
18 also part of that, called out in that equation, so it is not
19 left to chance, that DOGGR will retain its expertise, CARB
20 will retain its in Monitoring and Verification, and whoever
21 the - I know we haven't dealt with pipelines yet, but
22 whoever that agency is.

23 MR. PERIDAS: Right. So it sounds like we have a
24 way forward.

25 MR. BAUER: I think before we close on that

1 particular subject, I just want to - and you just kind of
2 finished with your statement with this fact, Cathy - one of
3 the things I'm sensing or aware of is the pipeline issue of
4 CO₂ becomes important in here, especially as we start to
5 focus CEC about dealing from the CO₂'s separation to the
6 storage site, so that kind of brings them into that realm,
7 and I'm not sure how much or how little of the pipeline
8 authority they have in other applications right now, but it
9 certainly needs to be visited. It is one of our other
10 questions in other areas there, we need to have something to
11 deal with the CO₂ pipeline in the management. The other
12 thing about that, if you think about our conversation over
13 this last half hour, we also recognize that possibly
14 pipelines where you have multiple contributors of CO₂ in it,
15 and going back to the retrofitting situation, so that would
16 be inherent in our recommendation that CEC would coordinate
17 amongst that activity as the other permitting desires to add
18 to the pipeline came into place.

19 MS. REHEIS BOYD: Yeah, and if anyone can shed some
20 light on the State Fire Marshal's role, when we did some
21 inquiries, it sounded like they felt they did have the
22 authority to regulate intrastate CO₂ pipelines, we just don't
23 have any at the moment. But they felt that they did, so is
24 it really a question? Or -

25 MR. BAUER: Well, it's a question as we deal with

1 the CEC guidance we want to have because, are we putting
2 them in conflict with the State Fire Marshal? Or is that a
3 collaborative thing?

4 MS. REHEIS BOYD: No more so than we would put them
5 in conflict with the Division of Oil and Gas, or the Air
6 Resources Board, or, in my opinion, it's sort of part of
7 that collaboration.

8 MR. BAUER: Yeah, it's all fun then.

9 MR. RUBIN: Yeah, again, I think if the CEC were the
10 permitting authority for the sequestration project, under
11 its purview would be any other state agency that has the
12 expertise to contribute to that process. And so we - I'm
13 not sure what exactly the legal holes or regulatory holes in
14 the pipeline permitting issue are that need to be filled if
15 we can identify them, then we might have something to say;
16 otherwise, we could simply punt to the agency to identify
17 the appropriate State agency to deal with that issue.

18 MR. BAUER: Well, then, I think, George, you're
19 about maybe to try to sum up a statement of what we think
20 we'd like to have done, and I would submit that would depend
21 on both the agency Technical Assistance Counsel Committee to
22 help us flush out some of the details that should be within
23 the recommendation. So, George, if you'd like to state what
24 you think you've come to?

25 MR. PERIDAS: Here is what I think we've come to. I

1 think we're looking at appointing the California Energy
2 Commission as an agency with central oversight on the chain
3 of custody and relevant accounting, monitoring, and other
4 provisions for CO₂ from its capture, its point of capture
5 through transport and, finally, to its injection point. And
6 that role will entail coordinating between the agencies for
7 the relevant pieces, so the pipeline could be State Fire
8 Marshal, the monitoring and the injection wells itself could
9 be DOGGR, some accounting protocols on the capture side
10 could be ARB, but it would be the CEC's role to assign tasks
11 and oversee the integrity of the overall framework. Did I
12 capture that well?

13 MR. BAUER: I think you did and I'm going to ask if
14 you would work with Cathy and Ed to kind of frame up this
15 and then we'll get the TAC team to give us the kind of flesh
16 underneath it.

17 MR. RUBIN: I think, ultimately, well, we'll have to
18 see, based on what I've heard here, George, maybe we're not
19 in total agreement on this, the difference between the word
20 "permitting authority" and "coordinating authority" has very
21 significant implications, and one permitting authority would
22 require new legislative authority, and would make it clear
23 where the buck stops, it would stop with the CEC.
24 Coordinating authority would not require any legislation and
25 would leave it ambiguous as to where the buck stops. Ask

1 anybody who has ever been a coordinator in any Federal
2 Government or any State Government, coordinators don't have
3 power to make decisions, ultimately, and that might actually
4 be counterproductive to the goal of expediting the overall
5 process. So, maybe we need to talk a little bit more about
6 the pros and cons of those options, but I think they're
7 really two different options, and we can't really have it
8 both ways, I think, unless we say we can't decide whether we
9 want it this way, or the other way, and we'll punt to the
10 Governor, or the other Commissions to use their judgment.
11 I'd rather impose our judgment if we have a clear consensus
12 and, again, I recognize that we're missing several other
13 panelists.

14 MR. PERIDAS: I will defer to the lawyer, too, but I
15 think there has to be some permitting authority, you know,
16 consultation or coordination is not a legally binding or
17 meaningful term.

18 MR. RUBIN: No, but I mean, it's clear from the way
19 they're doing business now with current permitting authority
20 just for power plants that they clearly involve a variety of
21 other state agencies in that process, so we're not
22 undermining any of the other agencies or their authority,
23 but ultimately the question is who issues the permit.

24 MR. PERIDAS: Well, you could have a statutory
25 requirement that CCS projects acquire a permit from the CEC

1 for the CO₂ chain of custody, and that the CEC will farm out
2 the relevant pieces to the relevant agencies.

3 MR. RUBIN: Yeah. That's essentially -

4 MR. PERIDAS: Without affecting how the bulk -

5 MR. RUBIN: The rest of the facility is what you're
6 mainly concerned with -

7 MR. PERIDAS: -- of the industrial facilities.

8 MR. RUBIN: No, I'm in total agreement, but it's
9 permitting authority at the end of the day for the CCS
10 portion of a project that I think we should be explicit
11 about.

12 MR. PERIDAS: Uh huh.

13 MR. BAUER: Okay, but inherent in this, I would
14 submit that we are asking that the CEC has some ability to
15 move towards schedule, not just to kind of move things along
16 as schedule, not just hope that people will cooperate, so
17 there has to be some authority to kind of drive the train
18 forward, otherwise we're just asking for a Kumbaya moment to
19 realize our results.

20 MR. MURRAY: Just as a question, historically when -
21 this is Kevin Murray - I thought this would move along a lot
22 faster when I wasn't here - when someone is designated -
23 when an agency is designated as the lead agency, does that
24 usually come with some authority, or are they sort of asking
25 people to cooperate - historically? I mean, I'm of the

1 opinion that we need to proscribe and say people must
2 cooperate with them, or, if we have to, but we don't want
3 the lead agency to be asking for cooperation, we want them
4 to be leading a process.

5 MS. REHEIS BOYD: So, Susan, what is the definition
6 of a lead agency under CEQA?

7 MR. MURRAY: Yeah, I guess the point is what do we
8 have to say in order to make them have -

9 MR. RUBIN: The lead agency has permitting - does
10 that carry an authority? Or is it - do we even need to use
11 that word?

12 MS. BROWN: Well, it depends on whether you mean
13 "lead agency" under CEQA or "lead permitting agency," right?
14 there's a difference. In our statute -

15 MR. MURRAY: Well, I can tell you we don't mean lead
16 agency under CEQA because we mean lead agency under whatever
17 we're doing.

18 MS. BROWN: Permitting.

19 MR. MURRAY: We're not necessarily looking to use
20 some previous authority.

21 MS. BROWN: Right, but I mean, you could establish
22 in statute some kind of timeframe during which the lead
23 agency would have to act. In fact, that's how our power
24 plant statute works, it's 12 months.

25 MR. MURRAY: Would that, in turn, force the other

1 agencies which also have some input here to move on a
2 timeframe, you know, directed by -

3 MS. BROWN: If so designated in that statute, yes.

4 MR. MURRAY: Okay, so we do need to designate that
5 in that -

6 MS. BROWN: I would say so.

7 MR. MURRAY: So not only do we need to give them the
8 designation as a lead authority in permitting, but we also
9 need to give them the authority to make the other agencies
10 act on the timeframe.

11 MS. BROWN: Yes.

12 MR. BAUER: Well, just to be clear, further, while
13 we would want the timeframe direction, because that gives an
14 impetus, we, I think, had said that we don't want them to
15 have the judicial power to kind of override something. Is
16 that correct? The CEC's authority, as I understand it for
17 power plant siting, gives them an ability to judicially come
18 in on occasion, it has been very rarely utilized, where they
19 aren't getting to conclusion on something, or the conclusion
20 is not what they believe is in the best interest of the
21 State because it's a very local perspective, to go in and
22 say this is not in the best interest of the State. It is
23 not eminent domain, but it is somewhat smacks of similarity,
24 in my opinion. That is not what we're really asking for, to
25 come into - according to what the panel discussion was to

1 this point.

2 MR. MURRAY: That's what I'm asking for because I
3 think if you don't give them that, then you haven't done
4 anything.

5 MR. PERIDAS: I don't object to that, Carl, as long
6 as it's understood that this relates only to the CO₂ chain
7 and -

8 MR. BAUER: All right, I just want to make sure
9 we're clear because we've gone kind of through that while
10 you weren't here, Kevin.

11 MS. REHEIS BOYD: And it also has nothing to do with
12 just a simple EOR project using CO₂ for EOR purposes. We're
13 not changing anything for the existing -

14 MR. RUBIN: This is CCS, so the last S is
15 "sequestration."

16 MR. BAUER: Let me ask you this question, then, to
17 just be further convoluted. The EOR project with CCS, would
18 that fall into this realm or not?

19 MR. RUBIN: Any project that involves at the end of
20 the day sequestration of CO₂ to satisfy either of the two
21 current state laws -

22 MR. MURRAY: And by sequestration, you mean
23 captured.

24 MR. BAUER: Yes, captured and storage.

25 MR. MURRAY: It's an EOR, and you are just injecting

1 and you are not capturing -

2 MR. BAUER: You're not storing.

3 MR. MURRAY: Then this has nothing to -

4 MR. BAUER: And you're not going to take a storage
5 credit on it.

6 MS. REHEIS BOYD: If you're using CO₂ to get oil out
7 of the ground and that's your purpose, and you're not diving
8 into climate change world, then this does not apply.

9 MR. RUBIN: Yeah, that is not a CCS - that's
10 correct.

11 MR. MURRAY: Well, I think there's still a fine
12 distinction between if you're using CO₂ for oil recovery and
13 you have - and you expect to capture it there, as opposed to
14 let it dissipate however it would dissipate, and you're
15 expecting something for that.

16 MR. RUBIN: Then this applies.

17 MS. REHEIS BOYD: Yeah, it's your second part,
18 expecting something in the climate change world. Yes,
19 that's correct. If you're not entering into CCS as a
20 climate change mitigation, then what we're suggesting here
21 doesn't change any regulatory - current regulatory
22 authority.

23 MR. RUBIN: If it's not being used to satisfy the
24 requirements of 1368, or AB 32, it is not part of this.

25 MR. KING: So EOR as CCS has a fairly clear pathway

1 right now, right? So, how are we helping things by
2 involving the CEC in that?

3 MR. BAUER: CCS doesn't really have a clear pathway
4 right now.

5 MR. MURRAY: EOR with carbon injection has a clear
6 pathway, but not necessarily for CCS.

7 MR. KING: Well, for permitting it has - we're
8 talking about permitting here.

9 MR. BAUER: Not if you want credit for the storage.

10 MR. KING: Right, so that piece is completely loose
11 as far as how you'll get credit for storage.

12 MR. BAUER: Right, but this would allow within the
13 CEC's purview to clarify some of those things. If that is
14 what the upfront request is, if you just want to do EOR, and
15 you don't go to CEC on this issue at all, it would be a
16 simple-minded way to sum it up. If you just want to do EOR,
17 you do what you do right now until the law is changed - if
18 they change. It would be similar to looking at how you're
19 going to do a Class 2 or a Class 6 injection site under
20 EPA's proposed rulemaking. If you're going to do EOR,
21 you're Class 2; if you're going to do really storage, even
22 though EOR initially is what you're going to do, then you're
23 Class 6. Class 2 for EOR, Class 6 for EOR with storage.
24 I'm not saying it's easy, but right now there's nowhere to
25 go for that kind of, you know, smorgasbord approach, at

1 least by the way the agencies are responding to questions.

2 MR. KING: But it's really ARB's authority as to
3 whether you've reduced CO₂ or not, right?

4 MR. BAUER: ARB's authority, and we've got Elizabeth
5 Scheehle, we can ask her to come up and speak to this, and
6 if you would do so, Elizabeth? No good deed goes
7 unpunished, you show up here to listen and you get to talk.
8 Come on up.

9 MR. KING: I'm just wondering what CEC adds.

10 MR. BAUER: ARB is not about the in-ground issue,
11 they're about emissions. That might be an oversimplified
12 way to explain it, but maybe you want to expand on that,
13 Elizabeth.

14 MS. SCHEEHLE: Yeah, I would agree with that and -

15 MR. BAUER: Identify yourself, please, so people
16 know on the phone.

17 MS. SCHEEHLE: Oh, sorry, Elizabeth Scheehle from
18 the Air Resources Board. I think there is that distinction,
19 there is also a distinction between permitting and
20 crediting, and I think what you're talking about is a lead
21 agency on the permitting side, and that doesn't necessarily
22 have to do with the crediting side of things. So, ARB is
23 generally not on the permitting side of it.

24 MR. KING: And I thought - this is John again - I
25 thought we had started talking about the permitting and

1 crediting, and that's where I was getting a little bit
2 uncomfortable with CEC having a lead on crediting,
3 basically.

4 MR. BAUER: But if you're asking to inject and get a
5 permit to do EOR and CCS, because we're talking about having
6 permitting for CCS, you're in this convoluted realm.

7 MR. RUBIN: So right now, again, you come back and
8 ask why would anybody do CCS in California, my reading of
9 the current requirements is that the only reason it might be
10 done today is to satisfy the requirements of 1368 if you are
11 a power plant because there is a requirement to not exceed
12 1,100 pounds per megawatt hour, and if you're doing a
13 facility you have to satisfy that requirement. Under AB
14 32, no mechanism in place today to get credit for CO₂ that's
15 been sequestered. That's another - so, again, so I parched
16 this into a couple of different areas, one is getting
17 permission to do a CCS project, the other is getting credit
18 in the AB 32 accounting of greenhouse gases for emissions
19 that are reduced, which is another topic we need to get to,
20 that's the one we just heard about.

21 MR. BAUER: You're breaking your own rule.

22 MR. RUBIN: And that's a separate issue.

23 MR. BAUER: Yeah, okay. So we're good on the
24 permitting side, I think, with a recommendation that we'll
25 have to - and as George kind of cited. So if the Panel is

1 basically in agreement with that, then we'll move on to the
2 next opportunity.

3 MR. RUBIN: So, Carl, the next thing, while we're on
4 it, so we've talked about the process for getting the
5 permitting -- for getting a CCS project permitted -- we
6 haven't talked about the requirements for that permit and I
7 guess, as a Panel, again, we have two options, one is not to
8 say anything and leave it to the agencies to work it out,
9 the other is to offer recommendations or guidance in one or
10 more areas of what those requirements would be. So, I've
11 got a couple of thoughts about things I think would be
12 helpful and relevant to the accounting issue, as well,
13 that's why I think the order in which we take these might be
14 important. To me, the one that is most problematic, given
15 the legislative language that was nicely summarized in some
16 of the white papers, has to do with, right now, different
17 words that are used to express what are basically MMV
18 requirements for monitoring and measuring and verifying the
19 effects of CO₂ that are injected, whether it is harming a
20 source of drinking water, whether it is leaking into the
21 air. Right now, there's not anything - there's a lot of
22 ambiguity as to what those requirements would be. Again, in
23 the spirit of trying to get uniformity and ways that are
24 consistent with meeting the energy and environmental goals
25 of the State, I would like to see a set of permitting

1 requirements that are adequate to satisfy also an accounting
2 requirement on ARB's part. That is, we shouldn't be looking
3 at two different sets of requirements, one to get permitted,
4 and a different set of requirements to get credit for you
5 now are storing. I think that's another very critical area
6 for us to focus on because, otherwise, AB 32 isn't going to
7 work with CCS, and that's another area. And the specific
8 thought that I'd like to throw out in terms of a direction
9 for that, is along the lines of the comment I made earlier,
10 and Dave Hawkins responded nicely, of fleshing out the
11 notion of what a performance standard of some sort would
12 look like for the sequestration part of it, where
13 performance is probably characterized in terms of a set of
14 design criteria or standards whose goal is to achieve all
15 the other things that we want to ensure minimal or no
16 leakage, to ensure that groundwater is protected, all of
17 which are difficult to measure directly, but with sufficient
18 monitoring, and maybe it's even a separate research program
19 that needs to be carried out over a period of time, to look
20 at the link between a well-defined set of criteria and the
21 ultimate goal that is fuzzier, and when I say more difficult
22 to measure and monitor, in practice. And I was happy to
23 hear David Hawkins kind of embrace that notion, as well,
24 coming from him it's especially important that he would be
25 comfortable with that. What the details of that are, I have

1 no idea, but in terms of a guideline for rules and
2 regulations to be developed, I'd like to suggest that that
3 is our imprimatur. I'm almost certain that Sally Benson,
4 were she here, would endorse that concept, as well. She
5 mentioned it at our last meeting. I'd be curious as to how
6 others feel about that.

7 MR. PERIDAS: George Peridas, thank you for bringing
8 this up. I had three things on my list and I am going to
9 start exactly where you left, and this is the performance
10 standard for CCS sites. We have two precedents, at least
11 that I know of, one is from laws and regulations in
12 Washington State, and in Texas. The Texas statute, they
13 passed a bill two years ago that gives some incentives in
14 the form of tax credits and tax rate reductions for projects
15 that do CCS together with EOR, and they said that, in order
16 to get that, you need - I'm trying to remember their
17 language, I might not be quoting exactly, but a reasonable,
18 or a high degree of confidence, or a reasonable expectation
19 that you will get 99 percent plus retention over a thousand
20 years. The rules that the Department of Ecology in the
21 State of Washington promulgated, I think, again, two years
22 ago in relation to their equivalent of SB 1368, which is
23 ESSP 6001, that is again 1,100 pounds per megawatt hour
24 limits, said something along the same lines, that you need a
25 reasonable expectation that 99 percent will remain

1 sequestered permanently for a thousand years or more. The
2 emphasis, I think, in both of these phrasings is not that
3 you actually need to go and measure this over a thousand
4 years, but the answer is, like David Hawkins in the morning,
5 that the design criteria have to be such that you have a
6 high degree of confidence that your site will achieve that
7 performance, so that the probability and number of years and
8 retention percentage translate into sort of design
9 requirements for site selection, and for project operation
10 and monitoring, and so on. And it's highly doubtful, and
11 I'm, in fact, sure that the EPA rules that will come out
12 will not contain something like this, and I think it would
13 be very prudent, from my point of view, for California to do
14 something like that. So, that was point number one. Point
15 number two, in terms of recommending, we don't know yet
16 whether the two EPA rules that will come out of the USC rule
17 and the subpart to the Greenhouse Gas Reporting Rule will
18 give any authority for regulating CCS, of geologic
19 sequestration that takes place in conjunction with the in-
20 hand sort of recovery. I won't venture a guess, the rules
21 are with OMB right now, but I think California should be
22 prepared to fill that gap and designate its own agencies to
23 do exactly that, even though I've seen convincing legal
24 interpretations that this could be done under existing
25 authorities and laws, but I think we would avoid the current

1 confusion and/or reluctance from some agencies that exist
2 right now, if we give them explicit instructions to do that.
3 I think that's something I would like us to -

4 MR. BAUER: This is Carl Bauer. What would that be?
5 I mean, that you would suggest we need to tell them that
6 they need to do?

7 MR. PERIDAS: I think it would fit nicely under the
8 previous recommendation, whereby the CEC would have the
9 umbrella authority for the CO₂ part of the project, but I
10 would explicitly include GS that takes place in conjunction
11 with the EOR. It's not a different recommendation, I would
12 just explicitly say that this does not solely apply to
13 saline, it also applies to sequestration of -

14 MR. RUBIN: And it would have to be analogous or
15 potentially even - I'd say at least analogous design
16 requirements that essentially accomplish performance
17 standards, which is what we just talked about.

18 MR. PERIDAS: Right. So that was point number two.
19 And the third point is, I'm pretty sure that the combination
20 of the two EPA rules that are pending will not contain any
21 enforcement provisions, or any mitigation or remediation
22 requirements for geologic sequestration projects, in terms
23 of air emissions, so there might be some provisions that
24 relate to safeguarding groundwater under the UIC rule, but
25 if, for example, you get a well blow-out, or some other

1 event if you are ejecting above the lower most source of
2 drinking water, you might get a CO₂ - I don't know if
3 "leakage" is the right word because it has connotations, but
4 you might get a breach of containment or a migration of CO₂
5 outside your intended storage zone, which might not endanger
6 groundwater, but which might still be of importance in terms
7 of air emissions and climate. And the two EPA rules that
8 are about to come out, I do not think, will contain any
9 mitigation or remediation or enforcement provisions; our
10 reporting role is simply a reporting role, you just report
11 your emission and you're done. It doesn't mean that you go
12 and actually do something to mitigate a leak that might have
13 taken place, and so I think the State should be looking at
14 some requirements to that effect.

15 MR. RUBIN: Could that be something that is done in
16 conjunction with an ARB accounting scheme, George? Have you
17 thought through how that might be implemented? So, if there
18 were such a release, it would basically go into the
19 inventory?

20 MR. PERIDAS: Well, under existing authority, which
21 I repeat that I think can be done, it would be proscribed
22 CEQA mitigation measures to prevent significant impacts, but
23 I think if we could define that, it would make things
24 simpler when it comes to agencies taking on the tasks that
25 they should take on.

1 MR. KING: So, this is in the area of liability in a
2 sense because we're talking about what are the consequences
3 of a release from containment, and up to the point it's
4 injected, it's probably pretty simple because you have the
5 accounting ins and outs that you're doing, the balances, and
6 if you have some material escape through fugitive losses, or
7 whatever, they don't get counted as an injected ton of CO₂,
8 right? So now we're talking about a ton of CO₂ that's been
9 injected and some amount is released, and if we can agree
10 that the correct mitigation is to make up those tons
11 somehow, whatever the mechanisms are that are available, by
12 getting another ton and injecting it, or by an offset, or
13 whatever, and that is the end of the liability, then I think
14 that's actually very helpful to project developers in
15 defining strictly what they're responsible for if CO₂ gets to
16 the atmosphere.

17 MR. BAUER: Elizabeth, would you come forward from
18 ARB and share - Elizabeth has worked on developing the ARB
19 implementation of the AB 32 requirements.

20 MS. SCHEEHLE: I have. Elizabeth Scheehle, ARB. I
21 just wanted to say that a lot of this, the cap-in-trade
22 regulation will cover how that sort of thing would be dealt
23 with if we included sequestration, so I would just caution
24 in the sense of making sure that everything is treated
25 equally; so, CCS - coming up with something here that CCS

1 that isn't in line with, say, what the cap-in-trade
2 regulation will say about -

3 MR. BAUER: You're talking about the California cap-
4 in-trade?

5 MS. SCHEEHLE: Yes, about AB 32, because they deal
6 with things like what would happen with fires in a forest
7 and things like that, so there are permanence issues that
8 are dealt with under the regulation, itself. So that may be
9 where it should lie in terms of the crediting side of
10 things.

11 MR. RUBIN: So, again, does it make sense from your
12 perspective to have a single set of requirements -- coming
13 back to my earlier comment -- that would satisfy the ARB in
14 terms of what you need for accounting purposes, at the same
15 time you're satisfying, let's say, the CEC for permitting
16 purposes?

17 MS. SCHEEHLE: I think that we definitely want to
18 make sure that we are - that the regulations are similar and
19 we're not contradicting, that they make sense and go
20 together, and as much as we can make them overlap, we do.
21 Our system does, though, require us - any changes we're
22 going to make - to include CCS under, say, mandatory
23 reporting, we would have to go through our own regulatory
24 process. So it becomes more complicated. If you're going
25 to want to have the exact same requirements for mandatory

1 reporting at ARB as you would for monitoring the injection
2 site, whether that be at DOGGR, or CEC, or wherever it is,
3 it becomes a little more complicated because there is a
4 mandate for us to go through a public process with our
5 regulation and any changes to the regulation, so for it to
6 be included under that, it would have to go under a separate
7 regulatory process. And I'm not sure how you would deal
8 with that in terms of - I'm assuming that the other agency
9 would also have to go through that process, and maybe we
10 could somehow have a dual process going forward, but there
11 are some considerations on that.

12 MS. BROWN: I was just sitting here thinking - this
13 is Susan Brown again - that, actually, the Air Board doesn't
14 permit stationary sources at all, it's done at the local Air
15 District level, so we've got a whole other dimension that we
16 need to think about, I think, in incorporating permit
17 requirements. There's going to be, I think, a role for the
18 local Air Districts. So I see different levels here of
19 reporting requirements, the reporting requirements necessary
20 for accounting for carbon so that you can get credit and,
21 you know, at some point in the future when it is valued
22 under a cap-in-trade system, a carbon tax, or some other
23 regime, then there's the issue of emissions releases and,
24 you know, it sounds to me that, what I understand, the EPA
25 rules are really more aimed at water quality than air

1 quality, so I think we need to think further about that air
2 piece.

3 MR. PERIDAS: Well, one of the EPA roles is aimed at
4 groundwater and the other one is aimed at reporting
5 greenhouse gas emissions. The point that I was making is
6 that it's simply a reporting regime and doesn't oblige
7 anyone to do anything if you discover a leak. I was
8 thinking one of the EPA roles does deal with groundwater,
9 and the other one is a greenhouse gas reporting role. But it
10 has no enforcement provisions in it. You report away, and
11 as long as you're not endangering underground sources of
12 drinking water, you don't need to do anything, you just
13 report away. But in a covered and constrained well,
14 obviously that has implications and, from a legal point of
15 view, it has implications, too, because you might not be
16 endangering groundwater, but you might be causing other
17 types of environmental damage.

18 MR. RUBIN: The kind of thing I was thinking of in
19 terms of consistent requirements, if I use the example that
20 George offered earlier, which I think probably has its
21 origins in the FECC Report, let's say a criteria for getting
22 permitting is a set of performance and design standards,
23 whose purpose is consistent with the goal of having 99
24 percent permanence over a thousand years, which essentially
25 means a year to year basis, probably small or negligible,

1 essentially zero leakage in that sense. I'd like to see
2 that be sufficient from an ARB point of view in the
3 accounting rules, to say that the number of leakages is
4 zero, or epsilon, or whatever that value turns out to be, as
5 opposed to having to do a whole other set of issues that
6 requires a totally different - that involves a totally
7 different set of criteria. So, a condition of permitting
8 ought to be the expectation of zero leakage, and design
9 criteria that are intended to achieve that, and that ought
10 to be good enough, I would hope, for the ARB, as well, in
11 their rules. As I understand the language that's on the
12 table now, there are different words that are used that
13 could imply very different criteria and I'd like to see some
14 uniformity, whatever that turns out to be.

15 MR. PERIDAS: I'd like to put this forward for the
16 record, this does not reflect the panel's view of the
17 likelihood of any of these leaks actually taking place, but
18 from a legal point of view and an accounting point of view,
19 you do need to have the provisions in place to deal with
20 those things.

21 MR. RUBIN: Yes, absolutely.

22 MR. BAUER: Okay, I think we need to come to a point
23 now where we kind of pull this together. What is our
24 recommendation? So, if one of you would like to suggest a
25 summation statement of the recommendation around this issue?

1 MR. RUBIN: You want to try?

2 MR. PERIDAS: I'm not sure we've agreed, but I'll -

3 MR. BAUER: That's okay, let's put it up and then
4 we'll gang up on you.

5 MR. PERIDAS: All right, so I'm used to that. The
6 first one is a performance standard for the retention and a
7 performance standard for geologic sequestration sites, and
8 we might want to take it to a performance standard for the
9 whole CCS project.

10 MR. BAUER: So we would suggest it be developed
11 because we're not going to be able to give that standard
12 specifically. We can give points that need to be addressed.

13 MR. PERIDAS: Yes.

14 MR. BAUER: Yes, okay.

15 MR. PERIDAS: It could be aspirational retention
16 rates in a given likelihood over a number of years, it could
17 be something else, but these will translate into design
18 elements and operational elements of the project.

19 MR. RUBIN: So the recommendation would be to the
20 permitting agency, our guidelines would be that they should
21 flesh out the details of a performance standard involving
22 design requirements and other measures that are consistent
23 with the policy goal of protecting groundwater and
24 preventing emissions to the atmosphere, and maybe there are
25 numbers that go along with it, of the sort, but Washington

1 and other states have -

2 MR. BAUER: Would we recommend this as something
3 that needs to be done? Or would be recommend that the
4 legislative directed to the agencies to develop this, such
5 as the CEC as the lead agency?

6 MR. RUBIN: Yeah, the agency would develop the
7 details of what those design requirements should be that are
8 consistent with the overriding goal of ensuring minimal,
9 ideally zero, release of greenhouse gas emissions. Maybe
10 it's the kind of IPCC statement, the protection of
11 groundwater and the protection of public health.

12 MR. BAUER: And which agency would we suggest that
13 be?

14 MR. RUBIN: Well, if -

15 MR. BAUER: Or take lead on?

16 MR. RUBIN: -- if CEC is the lead permitting agency,
17 they, in conjunction with other agencies with the adequate
18 expertise, would develop those details. But the guideline
19 is that it should be performance-based design, special
20 occasions, and performance measures that are consistent with
21 those goals, as opposed to explicit requirements to prove
22 that we're not omitting anything, for example. We'll find
23 some more elegant language to say that in, but that's the
24 spirit of what I'm suggesting.

25 MR. BAUER: Comments from the Panel?

1 MR. PERIDAS: A clarification of those should
2 include mitigation and remediation measures. So, that was
3 one of them. I think the second one was the recognition of
4 how to properly perform CCS as a greenhouse gas or CO₂
5 mitigation measure under California's climate goals, as long
6 as it complies with the standard that we just mentioned.
7 And the third one that I have was an explicit granting of
8 authority to the State agencies under the CEC umbrella, and
9 then the farming out to do CCS in oil fields, in combination
10 with enhanced oil recovery, should the operator choose to do
11 that, to resolve occurrence - I don't know if ambiguity is
12 the right word, but confusion.

13 MR. BAUER: And which agency would you be suggesting
14 for that?

15 MR. PERIDAS: Well, this is still under the CEC -

16 MR. RUBIN: It would still be CEC. So we would
17 define the CCS project as including projects in which CO₂ is
18 sequestered in conjunction with enhanced oil recovery, and
19 just make that explicit.

20 MR. BAUER: Are you all right with that?

21 MS. REHEIS BOYD: I want to see it, but we are
22 writing all of these up, right?

23 MR. BAUER: Yeah, well, hopefully. John, do you
24 have any comments, thoughts just initially -

25 MR. RUBIN: That would actually be probably the

1 first element, so basically define the CCS project, and CCS
2 projects would be defined to include projects in which
3 geologic sequestration is carried out in conjunction with
4 enhanced oil recovery or production of hydrocarbons, we
5 could generalize the language. Then, once the projects are
6 defined, then we have the criteria for monitoring and
7 measuring.

8 MS. REHEIS BOYD: For purposes of CCS, correct?

9 MR. BAUER: Not for EOR.

10 MS. REHEIS BOYD: Right.

11 MR. RUBIN: And we could be explicit. John, I think
12 it might have been your point, that projects whose sole
13 purpose is the production of hydrocarbon is using CO₂
14 injection would not be included in this role?

15 MS. REHEIS BOYD: Yeah, great.

16 MR. BAUER: John, do you have something else you
17 want to say?

18 MR. KING: Yeah, so that important point that Ed
19 just verbalized, but I think in principle, trying to handle
20 all the geologic sequestration projects with a sort of
21 similar framework and have it under one agency does make
22 sense. We'll have to look at it.

23 MR. BAUER: It will bring some standard rationality
24 to it. Other comments on that? Okay, I would suggest we
25 take a short break. We have a lot to cover yet, unless we

1 want to stay very late tonight, so it's 20 after, let's
2 start again at 2:30, please. It is actually 18 after, I'm
3 giving you two minutes leeway. We'll resume at 2:30, moving
4 to the next topic.

5 (Off the record at 2:18 p.m.)

6 (Back on the record at 2:31 p.m.)

7 MR. BAUER: Okay, does someone on the panel have a
8 next recommendation for a priority that we want to bring
9 forward. Just to review where we've come, we've come to a
10 pore space recommendation, we've come to kind of a broad
11 space about regulations and implementation, lead agency for
12 permitting recognition. I think someone wanted to make a
13 recommendation about the formal recognition of CCS as an
14 important tool?

15 MR. MURRAY: Yeah, I just think we need to set -
16 Kevin Murray, who keeps forgetting to identify himself, for
17 those of you on the phone - I just think - and I think we
18 mentioned this once before in one of the previous meetings,
19 I think we do need to say at the outset that we recommend
20 that the State adopt as a policy matter CCS as a viable
21 method. We'd have to work on the terminology - no we don't,
22 because he's giving me the terminology. This says the
23 Governor should acknowledge, but I would turn this into the
24 Legislature should pass a resolution which acknowledges that
25 carbon capture and storage is a tool in the arsenal for

1 reducing greenhouse gas emissions from large emitting
2 services, large emitting sources, and this says "consistent
3 with the intent of AB 32," and I would actually delete that
4 part because I think we should do it regardless of how AB 32
5 ends up, and also that CCS is one of the many advanced
6 technologies which the State of California is pursuing to
7 reduce greenhouse gas emissions. So that says two things.
8 It's the policy of the State that CCS is one of the tools in
9 the arsenal, and it also explicitly states that there are
10 other tools we are pursuing, so that gets rid of some of the
11 naysayers, I believe. So, there you go, that's my - I agree
12 with that recommendation. But I would draft it as the
13 Legislature should pass a resolution which indicates it's
14 the policy of the State of California.

15 MR. BAUER: Uh huh. A comment on that -

16 MS. REHEIS BOYD: Since this report eventually will
17 also go to the Governor, I am assuming, from the three
18 agencies, can we expand that to also include that the -

19 MR. MURRAY: Oh, and you could say "and the
20 Governor."

21 MS. REHEIS BOYD: Thank you.

22 MR. BAUER: Any other comments or thoughts about
23 that. George?

24 MR. PERIDAS: I'm okay with this, with the caveat
25 that we don't single out CCS as the favored technology for

1 climate mitigation here, and as long as the loading order
2 which puts efficiency first, renewable second, which is
3 already established as respected.

4 MR. MURRAY: Again - this is Kevin - I agree with
5 that, does saying that CCS is in the arsenal and explicitly
6 stating that we are pursuing other - what's the term - yeah,
7 that we are pursuing other advance technologies - meet your
8 -

9 MR. BAUER: This is Carl Bauer. I think we could
10 recognize - in fact, this morning, I think actually David
11 used some terms, I believe, in a statement about recognizing
12 the importance of efficiency and renewables, but also that
13 the magnitude to CO₂ and greenhouse gas challenge is so
14 great, and then to this statement would probably accommodate
15 what you are suggesting, of recognizing right up front
16 efficiencies and renewables are important.

17 MR. RUBIN: I don't know that we really need to go
18 into - I mean, I think the fundamental statement is that CCS
19 should be explicitly recognized as one of the several
20 mitigation options available to comply with AB 32 -- the
21 requirements of AB 32.

22 MR. MURRAY: Your concern, George, I take it, is you
23 don't want to elevate CCS above other things.

24 MR. PERIDAS: Correct.

25 MR. RUBIN: So you're just recognizing it as one of

1 several -

2 MR. BAUER: I think we're doing that. But do we
3 agree that the intent is not to raise CCS as the end all be
4 all, but just as one of the tools. I think that is George's
5 point.

6 MR. PERIDAS: Yes.

7 MR. RUBIN: Question is whether you want to mention
8 the others, you can either leave it as generally, or one of
9 several, or along with such things as efficiency, and so
10 forth.

11 MR. MURRAY: I would argue the synonyms and other
12 things, I mean, our charge is CCS, so let's say CCS is
13 valuable and explicitly state that it's not the only
14 valuable technology. But I wouldn't get into mentioning
15 other technologies.

16 MR. RUBIN: Yeah. I don't even know that you have
17 to say it's valuable. You really have to say it should be
18 recognized as an option. That's really what we're trying to
19 do, we're trying to make it an option.

20 MR. PERIDAS: Let's proceed as you stated and then
21 I'll -

22 MR. BAUER: We can play with the paragraph as we
23 frame it, but basically -

24 MR. MURRAY: We have consensus on the idea.

25 MR. BAUER: Do you want to - I'll send you

1 something, you can mess with it, and send it back - so Carl
2 Bauer has got the lead to write a rough for this, Kevin will
3 take it and make it more palatable, and then we'll circulate
4 it amongst the panel for consideration.

5 MR. RUBIN: Carl, there are two other issues on my
6 short list that we probably want to have something to say
7 about, one is what we want to say about public outreach and
8 communication, the other is whether we want to say something
9 about the development of a fund to cover any costs
10 associated with the long term stewardship phase of a CCS
11 operation. Neither -- well, one of those is on the list,
12 the other isn't.

13 MR. BAUER: This is Carl Bauer. Do we want to state
14 it more specifically, or just recognize that it's important?
15 Do we have some guidance? Because, you know, there are many
16 things going on around long term stewardship and things
17 around the country, and at the national Federal level, as
18 well, the State is looking at various things. So how do we
19 want to push that?

20 MR. MURRAY: I think we've had a lot of discussion
21 about long term stewardship in terms of liability, which is
22 really what people talk about, but -

23 MR. RUBIN: This is different, this is not
24 liability, this is -

25 MR. MURRAY: Yeah, I was going to ask sort of in

1 practical terms, you inject a bunch of CO₂, you're finished,
2 and you cap it. Then, there's the idea of who maintains,
3 you know, once this entity that did all this probably
4 doesn't exist anymore, then; or, the smart one has probably
5 changed that asset to a different -

6 MR. RUBIN: You have to pour a little more cement
7 around a hole, for example, 50 or 100 years from now. Who
8 pays for the cement?

9 MR. MURRAY: Well, what about security?

10 MR. RUBIN: Security is another issue.

11 MR. MURRAY: What if an off-road vehicle runs over
12 it? Or runs into it? Or some third party somehow damages
13 the well cap? What happens - I mean, that's what I'm more
14 worried about. Thirty years from now, the entity is gone,
15 the fences are either down or failing, and there are people
16 moving around on this land one way or another.

17 MR. RUBIN: So there's really two issues that we've
18 talked about in previous meetings, but it hasn't come up
19 here yet, so let me raise the issue. One is, I don't know
20 if it's part of the permitting operation, it's really
21 separate from that, you need a rule or criteria or a process
22 for site closure, so basically that's the point at which a
23 custodial agency - I'm trying to use words that are as close
24 to the sentiment we heard from David this morning because I
25 think that was kind of the right area - there would be a

1 custodial function barring any new developments at the
2 Federal level or anything else; at the State level, there
3 would need to be a custodial function that probably the
4 State would carry out, which would oversee and be
5 responsible for kind of the long term, indefinite
6 maintenance, as needed, of closed CCS sites.

7 MR. MURRAY: Maintenance and security.

8 MR. RUBIN: Maintenance and security. And which
9 would, in principle, need some resources, some funds to
10 cover any expenses that might be incurred in those
11 functions. So, there's really two additional pieces of the
12 overall structure, one is criteria for closing a site, which
13 is basically the point at which the custodial agency, then,
14 takes over; and the other is establishing a mechanism to
15 fund that activity. Neither of those have anything to do
16 with liability, as we talked about earlier, we haven't
17 really talked about that, so absent anything liability, it
18 stays as it is today. Potentially, we could say something
19 about that, but that's a third area. But those are the
20 three remaining issues, I think, once we have something
21 permitted - it's permitted to start, but when is it
22 officially over? And when does that custodial agency take
23 over? There needs to be a process, I would suggest, a
24 process for establishing criteria for that.

25 MR. BAUER [presumed]: You're talking about close-

1 out and transitioning into it?

2 MR. RUBIN: Yeah, up until that time an operator,
3 somebody who is doing the sequestration, is responsible for
4 the site. At some point, the Regulator or the Permitter has
5 to say, "This site is officially closed," it's met some
6 criteria, criteria that have been specified in other states
7 have to do, for example -

8 MR. BAUER: Let me ask a question. Are you thinking
9 that, to get a permit, one has to also put in a close-out
10 plan? Or do you think that is something to be done later on
11 based on the longevity of what we would anticipate a site
12 being utilized?

13 MR. RUBIN: I suspect that might be something -
14 well, that would be nice if you could do it up front, but it
15 might take a little more time until we include some
16 experience with it.

17 MR. BAUER: Well, I think it's very hard right now
18 since we're struggling - and I don't mean just the Panel -
19 with defining how one permits to even identify what the
20 close-out criteria might be that has to be met. I think
21 recognizing that is an important aspect, maybe.

22 MR. RUBIN: Yeah. So, I guess in the same way,
23 we're trying to be explicit about responsibilities of
24 different agencies. One of the responsibilities of the
25 permitting agency, I would argue, is the responsibility to

1 articulate clearly a set of criteria for closing a site and
2 having responsibility transition to the custodial agency.

3 MR. MURRAY: Well, that presumes a couple of things
4 -

5 MR. RUBIN: That doesn't have to be done now, but
6 basically we're saying, "It's your job to get this done."

7 MR. MURRAY: But it also presumes that whatever
8 entity actually did the sequestration, then essentially
9 transfers this responsibility to some stewardship agency.
10 And then I have kind of a fundamental property question.
11 Once the mineral rights holder, or the pore space rights
12 holder, finishes doing whatever they're doing, they no
13 longer have a property interest. And secondly, this cap
14 also presumes that - I mean, I'm presuming, somebody tell me
15 if I'm wrong technically - that the cap and the things we're
16 talking about securing and protecting are on the surface, so
17 are they not?

18 MR. KING: I think you plug the well. And the cap
19 rock is thousands of feet underground, so you could -

20 MR. MURRAY: So there is no impeding the surface
21 rights holder's -

22 MR. KING: No, unless you want to be able to go back
23 in again.

24 MR. MURRAY: In the EOR instance, you're drilling
25 and there's a bunch of surface stuff, and so you have the

1 right to take all the stuff out of the ground and the right
2 to do whatever you need on the surface to do that. So we
3 also have to make sure that whoever has stewardship has the
4 right to, for instance, go in and inspect, go in and pour
5 more concrete if needed, go in and do whatever they have to
6 do to maintain that cap, which is another -

7 MR. KING: But it's not like a plug in a
8 [inaudible].

9 MR. MURRAY: Well, but, for instance, to do
10 everything that Ed says this stewardship agency needs to do,
11 you've got to access the property.

12 MR. BAUER: Larry, I see you out there. Do you have
13 any light you want to shed on this?

14 MR. RUBIN: We also need to say -

15 MR. BAUER: We teach you to close your eyes when we
16 weren't looking, huh? Yes, and our gentleman from the USGS
17 is right behind you. He can come up and do a dual if you
18 like.

19 MR. ?: The gentleman from the California Geologic
20 Survey is probably better to answer the question about what
21 happens in the oil and gas sector.

22 MR. BAUER: Would you like to take a shot at it?

23 MR. MURRAY: Not really, but you will anyway.

24 MR. BAUER: Please identify yourself, as well,
25 please.

1 MR. CLINKENBEARD: John Clinkenbeard, California
2 Geological Survey. Not really, my corner of the world would
3 be better with DOGGR, but normally, once you finish with the
4 well, you do plug and abandon the well, and they cut it down
5 below ground surface, I think, and backfill it with cement,
6 so it's there. So, you may want to know for X why you're in
7 some monitoring and verification period you may want to have
8 that well head still at the surface, but at some point, you
9 know, probably they're going to plug it. Whether you leave
10 it at the surface so you can still find it, or you cut it
11 down and know where the lat-long of it is, and be able to go
12 re-find it or not. But in a normal oil or gas well
13 abandonment, you know, it would be below grade.

14 MR. MURRAY: And in that situation, do you have
15 pressure? Like, presumably you've filled this pore space
16 with carbon such that there's still some pressure, as
17 opposed to capping a well at which you -

18 MR. CLINKENBEARD: A well that's going to produce or
19 is idle, they would cap it, but they wouldn't fill it with
20 cement. When they plug and abandon a well, they actually go
21 in and pump cement plugs at various levels.

22 MR. BAUER: Identify yourself.

23 MR. ?: Yeah, I've got to get my lunch somehow. I
24 can talk to the pressure issue. The pressures will tend to
25 go away over time with regards to CO₂ storage, so this is not

1 a question over very long periods of time of having a highly
2 pressurized well to deal with. There will be some - how far
3 the pressure does go down depends on the specifics of the
4 reservoir and the situation, but, generally speaking, the
5 pressure will go down.

6 MR. MURRAY: And would you say that, presuming that
7 we have some regulations and if this site is capped
8 properly, and it's capped below surface properly, then there
9 is kind of nothing to do after that?

10 MR. RUBIN: Kevin, let me - I just remembered why
11 this stuff was so fresh. So, I drafted a piece, it's in our
12 draft guideline on summarizing what other states have done,
13 states that have done this now. So, there's a table, you
14 probably haven't had a chance to look at it because some of
15 this just got done recently, but, for example, I tried to
16 put together a couple of tables that contained some of the
17 key elements of what other states have been doing in their
18 current policies, and which I think California would also
19 need to say something about. So, for example, there's this
20 Table 2 in the draft that is titled "State Requirements for
21 Closure of a Geological Sequestration Site," and there are
22 two columns, one is the "Requirements for Closure" and the
23 second is "Consequences of the Closure," and there are four
24 states that have done this now. So, for example, Kansas is
25 the first one on the list, their requirements for closure,

1 the official closure, is to demonstrate that the CO₂ plume is
2 stabilized, contained, and not a threat to public health
3 safety and usable water, and that the CO₂ reservoir pressure
4 is stable. Other states have other kinds of criteria,
5 things like literal or no risk to future environmental
6 impacts, various kinds of things. Consequences of those
7 things, in the case of Kansas, the consequence of that
8 determination, which would have to be made by a permitting
9 agency, is that the CO₂ storage facility permit is then
10 revoked and subsequently any monitoring and remediation is
11 paid for by a state trust fund which is also established
12 under their state rules. It would seem to me to be
13 complete. California would have to have an analogous set of
14 policies basically to describe what happens at the end of a
15 useful life. There is also a table and this is basically
16 thanks to one of our colleagues, Melissa Pollack, is part of
17 the CCS Reg project, just again a summary of approved uses
18 for these state trust funds and, again, different states
19 have done and said different things. Some states have said
20 that these funds can be used only for monitoring what's
21 going on, some states have said they can be used for
22 monitoring and limited remediation, which is basically
23 cementing stuff. Other states have said things that
24 basically would leave the state liable for tort liability
25 and climate liability, so there's a set of consequences

1 about making that determination that, again, I think it
2 would be better to be explicit about what we suggest to
3 California rather than leave that -

4 MR. BAUER: But, so what would our recommendation be,
5 though? I mean, obviously we're not going to write what
6 they should do -

7 MR. RUBIN: Well, this is something - and Sally
8 would be the best person to help draft a suggestion in this
9 particular area. We could look at what some of the other
10 states have done, but basically the question is whether
11 California would do something different from what other
12 states have done. I would defer to Sally and ask strongly
13 that she suggest and propose something there, at least in
14 terms of what the requirements ought to be for closure of a
15 permitted site. The consequences of that are things that we
16 might also all have some input to, presumably revoking the
17 permit to inject is clearly one of those consequences, once
18 it's closed, and again, the key is that that would be a
19 transition to this other phase, so we would have to
20 basically establish either now or a process by which the
21 agency responsible for long term stewardship is identified;
22 it could be the permitting agency, but it might be something
23 else, and see how we feel about the notion of establishing a
24 trust fund or a fund that would accumulate during the
25 operation of approved sites to raise money that would be

1 used to handle any approved uses of those funds in the post
2 closure period.

3 MR. ?: Inaudible

4 MR. RUBIN: Yeah, but it's not something we should
5 overlook.

6 MR. BAUER: We'll get Sally Benson to give us a
7 suggestion on that and we'll decide what our recommendation
8 will be, based on that. I will submit that we want to focus
9 our recommendations to a limited few, but we can't cover the
10 whole waterfront - first off, we're not really qualified
11 with enough knowledge. George.

12 MR. PERIDAS: Thank you, Carl. I would second the
13 recommendation. I think we have some clear regulatory gaps
14 and the first one is, there is still a lack of closure
15 criterion, you know, when can you consider a site closed.
16 The second one is that we have the situation where you hand
17 off a site, you might be required to plug and abandon, but
18 then, after that, who takes care of it? And I think it's
19 good state policy for California to keep gnawing on these
20 sites without implying that they will need continuous
21 tinkering with, and to ensure that the intended climate
22 benefits are indeed taking place, and to intervene in a
23 timely fashion if it's needed. On the issue of drafting, we
24 do have some language already and that was put together by a
25 coalition of what's called a multi-stakeholder group, which

1 includes a wide range of participants from electric
2 utilities to API, to environmental groups, and they came up
3 with draft language which I think has been updated at least
4 once, on what should be established prior to closures. It's
5 a draft set of, I don't know, six bullet points, if I
6 remember, for closure criteria, so that could be a starting
7 point.

8 MR. BAUER: Well, we might include that in our
9 report with the recommendations for consideration as a
10 starting point.

11 MR. RUBIN: And, again, just by way of guideline, to
12 Sally or anybody else, whatever those criteria are that we
13 would recommend, it is, I think, important that they be -
14 that they avoid ambiguities, so that basically things that
15 are measurable, demonstrable, and clearly specified, so as
16 to minimize the heartburn of an organization that says
17 "these words are so ambiguous, I'll never know when I really
18 have met them." So, things that can be more objective would
19 be preferable to things that are fuzzy.

20 MR. PERIDAS: Yeah, but I think I see that as the
21 easy part of this task -

22 MR. RUBIN: Yeah.

23 MR. PERIDAS: -- because the rest is to determine
24 which agency does it, how they get funded, if we do have
25 this trust fund, who pays into it, and is the CCS industry

1 in California a large enough pool in order to provide these
2 kinds of funds, could this fund be rated by the Legislature
3 for an entirely different reason, and what happens if a fund
4 gets depleted. We've opened up a fairly complex issue, I
5 think.

6 MR. KING: Good suggestion on the criteria, though.
7 I think it's a good starting point that you've suggested.

8 MR. RUBIN: So, again, I think my sense is we
9 shouldn't overwork the problem at this stage, at this stage
10 of the game, that we should basically - you know, we're
11 basically trying to set up a structure. And toward that
12 end, I would suggest that our recommendation at least
13 tentatively now be that, for present purposes, the
14 permitting agency, which would be the CEC in our
15 recommendation, would be the agency that would be
16 responsible for the long term monitoring, barring any future
17 creation of a different or independent - I don't think we
18 ought to start -

19 MR. BAUER: It would be my intent to ask Sally
20 Benson to write up something, if you would like to give to
21 her with some of your perspectives, we'll also send her the
22 suggestion from the task force that has worked up those
23 points, and ask her to address this close-out and long term
24 stewardship monitoring concern as a way of a recommendation.

25 MR. RUBIN: Yeah. So, several states now have

1 policies where they're charging a few cents a ton of CO₂ to
2 start building up this fund and, again, the question is
3 whether California wants to follow that kind of model.

4 MR. BAUER: Okay. The next thing - anybody have
5 another area of concern that we think we should take on, to
6 recognize and recommend something for?

7 MR. RUBIN: So, again, I was just going through the
8 summary of other state requirements, financial assurance
9 requirements, this is now back in the permitting issue,
10 again, different states have slightly different
11 requirements, but, again, something along those lines would
12 be required. There are probably precedents in the State, I
13 would guess, for other kinds of operations. It would just
14 have to be explicit.

15 MS. REHEIS BOYD: Carl, on the community outreach,
16 public outreach, I thought David Hawkins made some really
17 good points and I'd like to circulate a few of those for our
18 consideration to put in the report. I wrote down quite a
19 few of them and I thought they were really good, so I'd like
20 the group to at least look at them.

21 MR. BAUER: I actually asked if we could get a copy
22 of the speaker notes, too, so George said he would try to
23 get them for us. Other points, recommendations that we want
24 to bring forward?

25 MR. KING: Have we addressed - this is John King -

1 have we addressed the crediting mechanism work that we think
2 is needed as part of that regulatory framework?

3 MR. BAUER: We touched on accounting, but not in any
4 great detail. So you're talking about how you recognize
5 value or -

6 MR. KING: Yes.

7 MR. BAUER: -- by way of quantity of CO₂ stored or
8 moved?

9 MR. KING: Yes.

10 MR. BAUER: Yeah, we have not really developed that
11 or a recommendation about the need for development.

12 MR. KING: But that was in one of your top priority
13 points.

14 MR. BAUER: We spoke to it briefly as trying to get
15 recognition through ARB's recognition of various CO₂ issues.

16 MR. RUBIN: I think, based on what I recall from the
17 White Paper and other conversations, the key issue that
18 stuck in my mind about that one is consistency between ARB's
19 requirements and the permitting agency's requirements for
20 monitoring, measuring, and bringing those two into harmony,
21 I think, will be the key need there.

22 MR. BAUER: Okay, Ed, would you write an e-mail on
23 that?

24 MR. RUBIN: The rest of it, I think, John, is
25 relatively straightforward within the ARB purview.

1 MR. KING: Okay.

2 MR. BAUER: Let me ask if there is a recommendation
3 that we agree on, or would want to talk about on the
4 suggestion that the State seek primacy on permitting?

5 MR. RUBIN: Under Class 6?

6 MR. BAUER: Yeah.

7 MR. RUBIN: Why don't we see what Class 6 looks
8 like.

9 MR. BAUER: Well, it would be my observation that,
10 you know -

11 MR. RUBIN: It would probably be better.

12 MR. BAUER: -- I would suggest at least a part of
13 the recommendation would be that the State should engage
14 actively in the discussion at this juncture, rather than
15 wait for a determination by EPA and then go forward to try
16 to seek permission. In the basis of the EPA is weighing up
17 right now, whether they're even going to discuss primacy.

18 MR. RUBIN: Well, that's -

19 MR. BAUER: -- and I think it's important to be
20 involved in the discussion and suggest there be an interest
21 in primacy, even though they could say no later on.

22 MR. PERIDAS: I think it's implicit, if we expect
23 the State to go the extra step in terms of stewardship, in
24 terms of monitoring, in terms of a performance standard,
25 that it also seek primacy.

1 MR. BAUER: It may be implicit, but I think we have
2 to be explicit in our recommendations.

3 MS. REHEIS BOYD: Yeah, I agree. It should be
4 implicit now -

5 MR. PERIDAS: Explicit.

6 MS. REHEIS BOYD: Explicit, excuse me - now.

7 MR. BAUER: Okay, we agree with that recommendation?
8 Okay.

9 MR. PERIDAS: And Carl, I had two other.

10 MR. BAUER: Okay, George, please go ahead.

11 MR. PERIDAS: We haven't talked about pipelines. I
12 don't have a recommendation, but I'm just flagging that we
13 haven't talked about it.

14 MR. BAUER: We brought it up earlier and Ed's
15 suggestion was all swept together under the general CCS
16 thing, you know, in one sense - and I mentioned if we had
17 the CEC as the lead agency, would that take care of that, or
18 would they find themselves conflicted with another agency --

19 MR. RUBIN: Unless there's something -

20 MR. BAUER: -- and we opened and discussed it a
21 little bit further.

22 MR. RUBIN: That's right. And unless there's
23 something explicit, some guidance we want to give on that
24 topic, I don't know of anything off the top of my head,
25 except it's a gap that the CEC would identify the

1 appropriate agencies to take care of that.

2 MR. PERIDAS: I just don't want us to be seen as
3 dodging the hot question of do we grant eminent domain
4 authority. I'm not a fan of eminent domain, but I would
5 like us at least to discuss it.

6 MR. KING: Yeah, so right now pipelines have -
7 utilities have the ability to put in pipelines and have
8 eminent domain enter that, right? But the ability of -

9 MR. BAUER: Why don't we get Jerry to give us -
10 Jerry Fish is here and he has made a mistake in not leaving,
11 so we'll bring him forward to give a little update on
12 eminent domain and other things about CO₂ pipelines so we can
13 have a better conversation.

14 MR. FISH: Yeah, Jerry Fish, a member of the
15 Technical Advisory Team. Yeah, I think that's probably, if
16 there is a gap with respect to pipelines, it's whether or
17 not they can use eminent domain to get a pipeline route.
18 There is currently safety regulations that are administered
19 by the Fire Marshal that are common National Safety
20 Regulations for the pipelines, and that's probably the most
21 pressing issue is right of way, and it can be obtained for
22 short right of ways, and it may be that utilities can use
23 their broader utility authority to get them in conjunction
24 with power plants and other utility facilities, but just
25 generally, carbon sequestration projects that may be

1 constructed in saline formations, there's no authority out
2 there currently for them to be able to get a right of way
3 for that pipeline, and if it's a pipeline of any length, it
4 really will be necessary.

5 MR. BAUER: And from that standpoint, not that you
6 would recommend any particular agency, but do you see
7 something like that to be under the lead agency?

8 MR. FISH: It's often connected with a finding by a
9 lead agency of public interest for the project itself
10 because that's usually a requirement under the state laws
11 that it be in the public interest, and it meshes well.

12 MR. BAUER: Okay, thank you, Jerry.

13 MR. PERIDAS: Jerry, one second, I'm not sure I
14 understood you. Are you saying that public utilities have
15 an automatic domain by virtue of being public utilities? Or
16 are you saying that the Energy Commission could rule whether
17 a non-power project is of public benefit, and therefore -

18 MR. FISH: They don't currently have that authority,
19 no. I mean, they need statutory authority, and it's an area
20 where the statutory authority needs to be fairly clear. If
21 it's for a carbon sequestration - or a CO₂ pipeline, that's
22 what you have to say, and our courts are very reluctant to
23 broadly interpret any eminent domain statute. So, the
24 authority needs to be clear. And with regard to utilities,
25 it changes over time, but generally in most states,

1 utilities, by virtue of their role as a utility, do have
2 authority to use eminent domain to acquire land for utility
3 facilities. An older example in California is that PG&E was
4 able to use its general utility condemnation authority to
5 clear up an issue with its McDonald Island Gas Storage
6 project. Somebody drilled into it and were producing gas,
7 and they hadn't required enough property, and they were able
8 to use their eminent domain authority to solve that problem
9 -- at some expense. More recently, though, the CPUC has
10 adopted a different set of rules with respect to gas
11 storage, and they do have the authority to grant eminent
12 domain to a gas storage project proponent, to acquire rights
13 of way for pipelines and ancillary facilities, and even to
14 acquire interests in property that are necessary for the
15 project, and it's all kind of wrapped up in their finding of
16 the public interest of the project itself.

17 MR. BAUER: Thank you. Other conversation on this?
18 It appears that it would be worthwhile to get something
19 framed up on this.

20 MR. RUBIN: That suggests to me that, if we're going
21 to be recommending that the CEC be the lead permitting
22 agency, and it would require a legislative authority, it
23 should include the ability for the CEC to exercise for CCS
24 projects that it finds to be in the public interest, the
25 same powers that it appears to already have for electric

1 power systems.

2 MR. BAUER: All right. Is the Panel in general
3 agreement with that?

4 MR. PERIDAS: I'm not sure I can endorse an eminent
5 domain -

6 MR. BAUER: Why don't we see what gets written up
7 and then we can talk to how comfortable or uncomfortable? I
8 mean, we need to get something clear.

9 MR. PERIDAS: Okay, but I'm raising the same kinds
10 of flags as -

11 MR. BAUER: Yeah, I know, I understand that, same
12 one you've raised earlier.

13 MR. PERIDAS: As the sub-surface property rights.

14 MR. MURRAY: I would also say that it is unlikely
15 that, to the extent that you need this to be statutory, I
16 think it's unlikely that you would get statutory support for
17 anything that comes close to eminent domain anyway. And I
18 think it also - once you start using the words "eminent
19 domain" or even the concept - or even the concept of it,
20 it's like one of the things Dave mentioned earlier, it's
21 just another bat that you give to people who want to oppose
22 for other reasons, it just becomes another thing and you get
23 all these people saying - you'll see flyers saying they're
24 going to take your property.

25 MR. BAUER: I think, then, perhaps if there is not

1 an agreement on the Panel to go forward and recommend a
2 seeking of this kind of authority, we probably at least owe
3 the agencies and the legislative body the understanding that
4 there may be occasions where the ability to do CCS will be
5 limited by the access to - by the lack of pipeline access
6 and possibly to lack of reservoir access, but that is a true
7 fact.

8 MR. KING: I think we also need to keep in mind that
9 what we're doing by restricting and not saying this is
10 needed is that you may be pushing CCS toward target
11 formations that are not the ideal, you're increasing the
12 cost because you may have a longer pipeline, so there are
13 all sorts of consequences to not providing this.

14 MR. BAUER: We may not be willing to go forward as a
15 Panel and recommend a grant or legislatively put this, but I
16 think we at least owe the recognition of the challenge that
17 this will produce in a broader scale.

18 MR. MURRAY: I think that's true, but I think my
19 response to that, John, is that you are absolutely right, we
20 are not going to end up at this Panel and whatever we end up
21 recommending to the Legislature is not going to make the
22 perfect scenario for CCS, but it's kind of, you know, don't
23 let the perfect be the enemy of the good kind of thing. I
24 think there are just certain realities that might make CCS
25 better, that are not going to fly either with the

1 Legislature or the public, and I think we've just got to
2 recognize that. Is this pore space an issue? I think yes,
3 and I think we should highlight it as a - I mean, the
4 pipeline access - highlight it as a significant issue, but I
5 don't know that you're going to get consensus on a
6 recommendation that we should allow some kind of eminent
7 domain.

8 MR. RUBIN: I think it's really in the same spirit
9 of the conversation we had this morning about unitization
10 for purposes of projects and maybe in the same way we had to
11 postpone that issue. You need to raise it as a point that
12 says, hey, if this is really going to be a serious and more
13 widespread option that deals with saline aquifers and it's a
14 serious contributor to climate change, that these issues are
15 going to have to be dealt with, but we thought it would be
16 overload to try to do that at this point for a variety of
17 reasons, finesse it.

18 MR. KING: I just wonder if we might not be able to
19 look at the existing statutes like Jerry cited, that provide
20 this authority for natural gas storage, and just add two
21 words "or CO₂" to that same statute with a very small
22 amendment that, you know, it doesn't have to be CCS
23 statutes, but just a very small revisions that says this
24 envisions and encompasses CO₂, as well. And clearly, CO₂
25 storage would be much less of a hazard than natural gas

1 storage, it's not flammable. So, it should be much much
2 easier.

3 MR. PERIDAS: I like the idea of looking at existing
4 precedents and maybe expanding eligibility, but gas
5 authority aside, what do oil and gas - produced oil and gas
6 pipelines - enjoy right now in the state? So, if you have
7 your production field and you take the oil through a
8 pipeline, does that pipeline -

9 MS. REHEIS BOYD: Most of it is on the oil and gas
10 [inaudible] property -

11 MR. MURRAY: We truck it, right?

12 MR. REHEIS BOYD: Are you talking from the well to a
13 tank? What exactly part of the chain are you referring to?

14 MR. PERIDAS: I'm talking about transportation
15 pipelines for produced oil and gas.

16 MS. REHEIS BOYD: Anything not on, so when it leaves
17 the private property.

18 MR. PERIDAS: Yes.

19 MS. REHEIS BOYD: Yeah, it's probably State Fire
20 Marshal or Department of Transportation.

21 MR. PERIDAS: Jerry, do you want to -

22 MR. BAUER: John, do you think you could write
23 something short up on some of your observations or concerns?

24 MR. MURRAY: I mean, I think I feel comfortable -
25 oh, go ahead.

1 MR. BAUER: Yeah, let me finish. You know, you have
2 kind of a thought and a recommendation, not that we put it
3 forth, but actually I think we'll have a better chance of
4 discussing it if you kind of couched your concerns in
5 writing so that we could then look at it and then maybe
6 exchange e-mails around it and try to work through it.

7 MR. KING: Yeah, I have a notion, but I don't have
8 specific language, so I'll have to see if I can develop that
9 within the - as a small addition to an existing statute, if
10 we can come up with something like that.

11 MR. MURRAY: I think, conceptually, that works.

12 MR. PERIDAS: But what I'm hearing is that
13 interstate pipelines that come under the authority of FERC
14 would get powers of eminent domain, but intrastate pipelines
15 would not.

16 MS. REHEIS BOYD: Correct. Maybe some exceptions.

17 MR. FISH: Mexico has a condemnation statute for CO₂
18 pipelines.

19 MR. PERIDAS: But in California, itself?

20 MS. REHEIS BOYD: No.

21 MR. PERIDAS: Just for natural gas storage?

22 MS. REHEIS BOYD: I mean, natural gas pipelines are
23 utility owned, right?

24 MR. PERIDAS: No, but storage, specifically.

25 MR. FISH: Jerry Fish, again. And we're actually in

1 the process of just finishing up the construction of a
2 natural gas storage facility near Fresno, and it went
3 through the CPUC. And eminent domain was considered for
4 both property acquisition and pipeline route acquisition,
5 and the authority was there for both through the CPUC. I
6 don't think ultimately it had to be used, but it was there,
7 and probably the reason it didn't have to be used was
8 because it was there.

9 MR. MURRAY: By the way, maybe this is a question
10 for you, Cathy, to the extent that oil and gas production
11 tends to be probably for a longer period than the period
12 that you're going to pipe CO₂ in for sequestration - or, I
13 mean, maybe that's a wrong assumption, but it seems like a
14 CO₂ pipeline is a shorter term. No?

15 MR. FISH: Well, the power plant my last 50 or 60
16 years and most oil wells don't.

17 MR. MURRAY: Okay, then I'm wrong, okay.

18 MR. KING: I think that's right.

19 MR. PERIDAS: I'm just saying that we should keep in
20 mind that oil and gas pipelines in the state have developed
21 and we have to have a pretty strong case as to why CO₂
22 transport is significantly different if we are to recommend
23 something like this.

24 MR. MURRAY: So, I think Carl's original idea about
25 - and John's agreement - to sort of circulate something.

1 MR. BAUER: We can to do that and then we can decide
2 if we can get traction around some form of a recommendation,
3 but if you don't mind doing that, John, that would be
4 helpful. Thank you. Okay, other points we would like to
5 make sure we address? George.

6 MR. PERIDAS: There was one that David Hawkins made
7 this morning on - I'm scrolling down to the end - commercial
8 considerations, incentives, policy drivers. And he raised
9 the issue of putting together a process whereby the relevant
10 agencies - PUC, CEC - consider what David thought was the
11 most likely means of incentivizing early projects, power
12 projects, at least, and that was PVA's Power Purchase
13 Agreements. And if I understood him correctly, he didn't
14 recommend that we have a - we prejudge the outcome by saying
15 that these projects, or a number of projects, should receive
16 those favorable PPAs, but that there should be criteria
17 established, and within the established loading order, the
18 state should consider granting PPAs as projects that indeed
19 meet the criteria.

20 MR. BAUER: I agree with that. Well, let me just
21 pull that a little further, go beyond PPAs, PPAs are fine if
22 it's the utility situation, but there may be other entities,
23 for example, a major ethanol plant, a major gas separations
24 plant, that may also like to do that, but they aren't going
25 to get a PPA, they have to have some other vehicle, so I

1 think the fact of a need for incentivization of some limited
2 number of early movers is an important recommendation, in
3 general. We may do, for example, on the PPA, with some fact
4 behind it, as well, we can think of another for example in a
5 non-utility situation, if you would consider that.

6 MS. REHEIS BOYD: And I think, George, if I heard
7 David right, he's open to the early mover concept, correct?
8 For some? Yeah.

9 MR. MURRAY: The other thing about the early mover
10 and the PPA thing that I think we have to address, which is
11 something of a mine field, is that, you know, under the
12 current scenario, in most cases, the municipal utilities
13 would not be subject to that, and we would be burdening only
14 the rate base of the investor-owned utilities with this PPA.

15 MR. BAUER: I think that's a good point, but if it
16 is in the interest of the state, then it may be more
17 appropriately built into like a wires charge situation.

18 MR. MURRAY: I would agree, but that's a - it's a
19 minefield. But I strongly agree that, if we're going to do
20 this, and we're going to add some benefit, and we think it
21 has statewide implications, that it should be - if there's
22 going to be some of it borne by the ratepayers, then it
23 ought to be the entire ratepayer base of the State, rather
24 than just the investor-owned utilities, which is still how
25 this generally ends up. So, I think that needs to be part

1 of the discussion or recommendations.

2 MR. BAUER: Well, let me just respond to that, you
3 know, if you think about that, then we may wind up with a
4 recommendation that the State has broad value out of this,
5 and so it should be broadly borne; however, at least for
6 early movers within PPA might be an alternative to that, and
7 if you're concerned that just trying to get a broad base of
8 support is going to be very much of a minefield.

9 MR. MURRAY: Okay, are you ready for - I guess we're
10 almost finished, but I would roll down to the role of public
11 outreach and environmental justice, which I think are two
12 things which are connected. I think public outreach is very
13 important, I don't think we necessarily need any kind of new
14 framework. I think to the extent that we designate a lead
15 agency, we make sure that within that authority they have to
16 do the types of public outreach that they already do with
17 public hearings and whatnot, and I think the other thing is
18 that we should require that the proponents of specific
19 projects, as part of their permitting process, indicate a
20 plan for public outreach, without proscribing what that
21 should be, or sort of reinventing the wheel. Obviously,
22 they have a vested interest in public outreach, particularly
23 to the extent that, you know, to the extent that we're
24 mirroring current processes for permitting, that there's
25 going to be public hearings, or whatever is involved in that

1 process. And I think the environmental justice part of this
2 is tied to that and, again, I don't want to reinvent the
3 environmental justice wheel, but I do think it's important
4 to recognize environmental justice as a significant issue,
5 and some broader statement that no - and, again, I'm
6 thinking off the top of my head and need some more time to
7 either draft this or take suggestions, but -

8 MR. BAUER: We'll give you the chance to draft it.

9 MR. MURRAY: I'm sure you will, but my general
10 suggestion is that we say something to the effect that no
11 geography or class of people, and I'm sure I can come up
12 with a better - should bear an undue burden, or a larger
13 part of the burden than the other - and I think that ties to
14 our original statement that CCS is beneficial for the entire
15 State.

16 MR. BAUER: Yeah, and we may put it with the
17 original statement, but we may also have a recommendation
18 more pointedly that they be the lead agency. I would say,
19 though, with that, where I think sometimes, in my limited
20 experience, but is that the EJ issues happen on a specific
21 case going - pick a neighborhood, and something is going to
22 happen there. When I think of public outreach, part of what
23 I believe, and David and I have actually had this
24 conversation, so I think he would agree with this, in part,
25 there needs to be one sense of public outreach into general

1 education and information, there is another sense when you
2 start more specifically looking at a region that's going to
3 have a plant or something put there. But if you don't have
4 the foundational information more broadly disseminated
5 across the State, and you have an awful lot of foundational
6 work to do before you can even go into the more pertinent
7 discussions.

8 MR. MURRAY: Well, I think you're going to have that
9 either way, and I think you're right, Environmental Justice
10 does tend to come up in the context of a specific project,
11 but that's because those specific projects tend to be put in
12 areas where there are people less able, for whatever reason,
13 to advocate. So, I think making that statement upfront that
14 no class of people, or no geography should have a larger
15 burden than the rest of the State - and, again, I've got to
16 come up with the right terms, and I also don't want this to
17 be sort of low hanging fruit for people who are
18 obstructionists, so I think we need to be very careful about
19 drafting it. But in some cases, you know, these projects
20 are going to be in existing oil fields, or existing saline
21 aquifers, and they kind of are where they are.

22 MR. BAUER: Well, you know, one of the things -

23 MR. MURRAY: It's not like a big box retailer or
24 something where you can sort of put it wherever you want to,
25 they exist in the geology wherever they exist.

1 MR. BAUER: Well, and in fact, based on that fact,
2 it may be worthwhile that the lead agency would kind of
3 start with those higher probability locations first as far
4 as their effort to educate, and that might be a
5 recommendation. There was another statement made, though,
6 in the discussion of recommendation that David didn't have
7 an answer for how to, but it was a good point, one of the
8 values is to have an objective, or not directly related to
9 the desired industrial entity who wants to make the
10 investment, provide subject matter experts, if you will.
11 And we might want to think about that recommendation because
12 I think there's a way to do that by way of a pool or an
13 association, a pool or something like that that may be worth
14 thinking about.

15 MR. MURRAY: As much as I like that idea at the
16 30,000 foot macro level, the reality is you're going to send
17 some PhD and whatever the subject matter is into some local
18 community and, with all due respect to the local community,
19 it's going to be a bunch of gobbledygook that they're not
20 going to really ascertain. Or, if that's not the case,
21 they're just not going to trust that anyway. I mean, in the
22 end, people like to get information from people that they
23 know and trust, and if somebody has got a better
24 suggestion....

25 MR. BAUER: I'll ask Rich Myhre to come up and - a

1 short input. As a communications guy, you know.

2 MR. MYHRE: I'm Rich Myhre with Bevilacqua-Knight, a
3 member of the Technical Advisory Team. I think you're on
4 track when you're thinking of universities, but besides just
5 technical PhD's, there are programs at universities that
6 sort of cross-cut technology, policy, economics, etc. In
7 fact, Ed's university has got one of the leading ones in the
8 country. And so, what you could do is basically steer money
9 towards those specific outreach oriented - there are - at
10 U.C. Davis -

11 MR. MURRAY: Give me an example because I'm trying
12 to find a guy that Mrs. Johnson and Mrs. Lopez and Mrs. Kim
13 are going to understand when they come to their Senior
14 Center or their community center. I'm not talking about
15 send people to the college, or send the college out.

16 MR. MYHRE: Okay.

17 MR. MURRAY: So is some little old lady or little
18 old man, who may or may not be college educated, going to
19 understand? And even if they understand, trust what this
20 college, university oriented person -

21 MR. MYHRE: I won't claim any expertise of the
22 subject, but as the WESTCARB Public Outreach Coordinator, I
23 have gone to Lion's Club meeting in Rio Vista, California,
24 and used the analogy of a rum cake in taking a straw and a
25 hypodermic full of rum and injecting it into the sponge cake

1 layer to show the porous zone, using the frosting -

2 MR. MURRAY: You're making my point because -

3 MR. MYHRE: -- as the shale zone.

4 MR. MURRAY: -- you're a communications professional
5 who would -

6 MR. MYHRE: I'm a mechanical engineer.

7 MR. MURRAY: Well, but your job now is
8 communications, so maybe you used to be an engineer, but now
9 you're a communicator! So, that's my concern. If we get
10 people like you, fabulous; if we create this technical
11 subject matter pool, I'm not sure that they all get what you
12 obviously get about making things understandable to people
13 on the ground.

14 MR. MYHRE: Sure, but let me be candid, I'm out
15 there doing that because the National Energy Technology Lab
16 of DOE basically put funds into WESTCARB specifically to
17 have people go do that, and so, I mean - by the way,
18 environmental NGOs, George Peridas' organization also has
19 sponsored public workshops on CCS, they don't have rum cake,
20 but they are - so, no, I think there are mechanisms, I think
21 through the University system. And I think encouraging - I
22 mean, for a whole host of issues related to climate change,
23 not just CCS, efforts to try and improve the ability of
24 scientists to relate to policymakers and the public, I
25 attended a workshop, it was the first of a series just a

1 couple weeks ago at U.C. Davis, it was sponsored by U.C.
2 Davis, and the Heinz Center out of Washington, D.C., so
3 there are programs out there, and I think your document
4 could basically recognize and encourage the support of such
5 programs, which is ultimately probably a legislative budget
6 item.

7 MS. REHEIS BOYD: I'm going to write it up, Ed.

8 MR. MURRAY: Now you've really dragged it down by
9 describing it as a budget item. I only say that - I think
10 that's great, I'm skeptical that there are that many people
11 out there that can successfully translate in the way that
12 you talked about - and so I'm loath to fund a - like, for
13 instance, a program funded at WESTCARB who has, as part of
14 its mission to do public outreach vs. money to fund a
15 university program which has a bunch of people who are
16 highly technically skilled, but we're kind of teaching them
17 to do outreach, as opposed to -

18 MR. MYHRE: Well, you could turn it the other way
19 around, the Journalism Schools, there are science
20 journalism, a specialty within journalism. I mean, I think
21 there are - I would give it a chance, create the incentive,
22 support it with resources, and see what happens.

23 MR. MURRAY: I stand partially corrected.

24 MR. BAUER: Well, Rich, I would ask you to give
25 maybe just a paragraph of what you think that would look

1 like, okay? Just for our consideration?

2 MR. RUBIN: David characterized it this morning in
3 terms of access to independent experts in the context of
4 people who could go over that; that's not easy to do, but
5 there's another dimension which could also be useful, is
6 access to materials prepared by independent experts, very
7 different. Some of my colleagues that Rich was talking
8 about spend a long time doing this kind of stuff, so we have
9 psychologists who are experts in risk communication and
10 public perception. Part of effective communication of
11 anything technical is also understanding basically where
12 people are at when you start communicating. So there's this
13 concept of mental models, it was a project a number of years
14 ago, just talking about climate change, you can't start so-
15 called "educating the public" until you have some idea of
16 what they're currently thinking about, and so just the
17 process of kind of developing that understanding is also
18 part of effective communication. It's really painstaking to
19 do well and, so, it's certainly something to be encouraged,
20 but it has to be done, I think, thoughtfully and carefully.

21 MR. MURRAY: I think you're right, it is difficult
22 and it is painstaking. You know, I just come from having
23 spent so many years in the Legislature, or even on panels
24 like this where we all talk, you know, everybody is pretty
25 educated, and everybody is mostly middle class or above, and

1 we sort of - people get used to talking to people like
2 themselves, and if you talk about the variety and diversity
3 of the State -- socioeconomically and ethnically -- there' s
4 a lot of different types of audiences in our State and
5 finding people that can communicate in all of those. I
6 mean, even - you know, as a Legislator or as an elected
7 official at any level, sometimes you have difficulty
8 communicating these complicated concepts out to the public.
9 So, I think we ought to spend some time on it. I am a
10 little bit skeptical about sort of just pumping money into
11 things that we can't really, in advance, predict whether
12 they meet our requirements.

13 MR. RUBIN: It seems to me that maybe one other
14 opportunity that California could pioneer on, a different
15 type of communication, and it also came up this morning,
16 more effective communication to executives and influential
17 people within organizations that are liable to, or
18 contemplating, doing CCS projects. There's probably as much
19 misunderstanding or kind of casual information, even up to,
20 I would argue, probably CEOs of some major companies, as to
21 what exactly, for example, a long term prospect for CCS
22 looks like. So there could be education at a different
23 level, not public communication, but communication with
24 decision-makers within organizations likely to be involved
25 in CCS projects. Think about that one. I think that could

1 be something different.

2 MR. BAUER: Okay, I think the Panel looks like it's
3 had as much fun as they could stand for one day. Are there
4 any burning desires on one more thing to throw out there,
5 that we think should be a recommendation? Not that these
6 are totally complete, but I think we've covered a great deal
7 of space today. We all have different assignments to finish
8 certain pieces and provide them to each other, and the TAC
9 team is going to be doing some stuff for us both by way of
10 direct requests and by way of - I've seen some note taking
11 going on out there, so we'll have another raft of things to
12 read. We're looking for basically a final draft before
13 Thanksgiving or better. And we've talked about that. And I
14 looked at the list of opportunities for December meeting
15 date schedule and it looks like the 16th was a date that all
16 of us believe we could make available, December 16th was our
17 probable next meeting date if that's okay with everybody -
18 that's a Thursday, I believe. Yeah, we have the other four
19 members to get to, but for the members that are here, that
20 looks like it's good. So, everybody good? Thank you, all,
21 for your active involvement and willingness to be here.
22 Thank you for all who patiently sat through and watched the
23 paint dry, and those on the line who listened in, hopefully
24 it was beneficial. And we still can take some comments in
25 the future. And with that, I would adjourn the Panel

1 meeting today.

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[Adjourned at 3:33 P.M.]

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