COMMITTEE WORKSHOP

BEFORE THE

CALIFORNIA ENERGY RESOURCES CONSERVATION

AND DEVELOPMENT COMMISSION

In the Matter of:	)	
	)	Docket No.
2008 Rulemaking on Implementation of the Waste Heat and Carbon Emissions Reduction Act Pursuant to Assembly Bill 1613	)	08-WHCE-1

CALIFORNIA ENERGY COMMISSION

HEARING ROOM A

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

MONDAY, APRIL 13, 2009

10:04 A.M.

ORIGINAL

Reported by:
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ADVISORS and STAFF PRESENT

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ALSO PRESENT

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P R O C E E D I N G S

10:04 a.m.

PRESIDING MEMBER BYRON: I apologize for starting a little bit late. Good morning. I'm Commissioner Jeff Byron and I chair the Electricity and Natural Gas Committee. And today's workshop is on the 2008 rulemaking on implementation of the Waste Heat and Carbon Emissions Reduction Act.

This workshop on combined heat and power guidelines was also supposed to have one of my fellow Commissioners here, Commissioner Boyd. And unfortunately he cannot be in two places at once. He's at an important power plant siting case down in Chula Vista. I don't know if we'll have one of his advisors join us or not. However, I feel able to cover this subject area. It's extremely important to this Commission and to me.

If I could make a couple of opening remarks before I turn it over to Ms. Kelly. The combined heat and power seen by this Commission, and has been seen by this Commission, for a long time, as an important ingredient to California's energy future. For a number of reasons, the energy efficiency that's associated with CHP, the

greenhouse gas reductions.

But also something very important to me, and I think to a lot of consumers in California, is that it provides a choice, a customer choice, that's not available to them otherwise. Oh, maybe one other little thing, and that is that we really look for opportunities to bring private capital into the generation marketplace. Takes risk away from the rest of the consumers, and that's a very attractive option, too.

So, for these reasons, and others, I just jotted those down briefly a few minutes ago, CHP is really important.

Now, last year the Assembly passed the Waste Heat and Carbon Emissions Reduction Act, AB-1613, which recognizes the potential that CHP has. And under that legislation the Energy Commission has certain obligations, as does the Public Utilities Commission. And therefore, they've opened up a rulemaking. We'll learn more about those details of those actions later today.

But there's another organization that's also integrally involved and very interested, and that is the Air Resources Board. They're counting on the increased energy efficiency of combined

heat and power to reduce greenhouse gases in their scoping plan.

So today's workshop is to inform this Commission, primarily the Integrated Energy Policy Report, on the status of the progress and the recommendations going forward.

I see a lot of familiar faces in the audience, some folks that I haven't seen for awhile, and I'm really glad that you're here. I hope that we will have ample opportunity to hear from all of you, opinions of folks I respect very much.

So, I will stop there, thank you for coming, and turn this over to our able workshop chair for the day, Ms. Linda Kelly.

MS. KELLY: Thank you, Commissioner Byron. Welcome, everybody. Before we start there's some logistics that we have to go over very quickly.

First of all, there's a few items. For those of you who are not familiar with the building, the closest restrooms are located out to your left as you go out the door. There's also some restrooms over on the right past the guard if these are too full.

In the event of an emergency and the building needs to be evacuated, please follow our employees to the appropriate exits which are here and here. We will reconvene in the park. You should go to the park and then everybody -- they'll gather everybody together at the park, which is located across from the building there. And once you're there, if there is no real emergency, it's just a test, then we'll proceed calmly back to the building.

Also, there is a snack bar upstairs on the second floor right underneath the awning.

For call-in participation for people who want to call in, the number is 888-566-5914. And if you decide to call in, the passcode is rulemaking. It will be a verbal passcode. And the call leader is Linda Kelly.

If you're following along or you want to follow along on the webcast, it's www.energy.ca.gov.

Participation here in the workshop, I'd like to keep this somewhat informal so we have the opportunity to hear from everybody. The agenda is designed to have presentations at first, and then in the afternoon I'd like to focus on a lot of

interaction around the questions.

The Public Utilities Commission, we're going to get a briefing on what they're doing. And then our staff guidelines with the background, observations. And then the guidelines.

When Michael Colvin speaks from the CPUC, questions after his presentation would be good. For Art, on the staff guidelines, his presentation does some background. And then if you have questions there I think we could ask the questions there.

And then he has a very detailed presentation, so to make it easier so that people can keep focusing on the important issues, you know, as he describes each component of the guidelines he'll pause and let you ask questions after each slide. So that way, as you talk about efficiency, we'll be able to have a discussion around that particular recommendation. And then move on through the presentation, rather than trying to wait to the end and have everybody try to remember their questions.

If you would, the way we'll do it is Commissioner Byron will have the opportunity to ask a question. We'll go to the audience, and the

first time you speak if you will give your information to the court reporter, who is over there next to the tv, he'll take your information.

And then if you have subsequent questions during the day, if you'll try to remember to state your name again for people on the telephones, who will not be able to see you. That will really help the court reporter so that we have a full record.

This proceeding is also, because it is webcast, it will be recorded. And that recording will be kept -- I'm not sure, but I think it's for a week or two. But there will also be a written recording of this workshop, as well.

In the afternoon what I'd like to do is to reshape the room. In the afternoon we have several questions that we've asked for comments on. This is a chance to state your position on the record, to tell us what you think about our requirements.

And we have some border questions, too, because the issues around CHP are not always just narrowly focused on 20 megawatts and below. There's a little, you know, there's 22 megawatts, and so the questions are meant to generate good

discussion and a lot of information.

I think what we're going to do -- I don't think, I know -- I want to reconfigure the room into a roundtable where we'll be able to have 20 or more people at the table. And Commissioner Byron is going to join us at that roundtable so that we can have a good interactive discussion.

If you don't wish to join us at the roundtable, or if we don't have enough room, the podium will remain and you're free to come up and back and forth during the discussion. But this, again, will be the discussions of the issues and the questions of, as an example, is 60 percent the right number.

We have some additional presentations that were just brought to my attention, and so what I'll try to do is get the presentations done, either by the time we convene for lunch, or there may be one or two presentations first thing before we have our discussion in the roundtable format.

And at the end, of course, there's always time for public comments.

Commissioner Byron just gave you a quick overview, but AB-1613 is legislation that was authored by Blakeslee. It establishes the Waste

Heat and Carbon Emissions Reduction Act. The Act was the intent of the Legislature to advance the efficiency of the state's natural gas fleet by utilizing excess waste heat and heat through the use of CHP technology. This particular legislation focuses on 20 megawatts and below.

It's expected, and this is the intent of the legislation, that through efficient utilization of waste heat reductions in emissions of carbon dioxide and other carbon based greenhouse gases will result. This is really one of the major focuses of this legislation.

Also, of interest to us, as well, is the act also encourages the development of both customer- and utility-owned CHP. I think that there are a lot of challenges with that, but it is brought up in this legislation. And so if anybody has any comments on that, we would appreciate input with regard to that.

The responsibilities for this particular rulemaking were spread across three of the state agencies. The Public Utilities Commission establishes the policies and procedures for purchase of excess electricity from the eligible 20-megawatt-and-below CHP systems.

It is their job to adopt the rates and tariffs for excess electricity purchased from an eligible CHP system. And to adopt procedures to establish a pay-as-you-save pilot program with the IOUs for eligible CHP systems. Michael will give us more information on that and some other proceedings at the CPUC.

The California Energy Commission's role is to adopt and develop the combined heat and power technical guidelines that will establish the eligibility of CHP systems for incentive programs to be developed by the CPUC. These guidelines will also apply to the publicly owned utilities, as they begin to adopt tariffs for their CHP customers, as well.

The California Air Resources Board, after this all is done, they have to provide a report to the Governor on December 31st of 2011, on the reduction of emissions of greenhouse gases resulting from the increase of -- in CHP that soon will come from this particular legislation.

Depending on what that recommendation -- depending on what that outcome is, they will then, in this report, be required to recommend further actions to the Legislature to achieve these goals

of the legislation, which is to reduce CO2.

Now that I've given you an overview of what each of the state's role, I think as the day goes on you'll get a good indication of what we're doing with the guidelines.

But I would like to turn this over to Michael Colvin from the CPUC. And he's going to talk to you specifically about what the Public Utilities Commission is doing, and, you know, what they're doing with regard to the CHP OIR and CHP, in general. Michael, you can go right here, yeah. Here. There we go. That's me.

MR. COLVIN: That's you.

MS. KELLY: Sorry, it takes me awhile to get with this -- okay.

(Pause.)

MR. COLVIN: Well, good morning, everyone, and good morning, Commissioner. Thank you so much for allowing me the opportunity to come up here today. It is always great to get out of San Francisco and come up to Sacramento. The weather is certainly a lot nicer. So, thank you very much for that.

I wanted to just develop a little bit more detail and hopefully be able to do some Q&A,

expanding on some of the information that Linda was just providing.

What AB-1613 essentially allows us to do is create a feed-in tariff for the excess generation from a CHP facility that is less than 20 megawatts in size.

And really the goal is to create an incentive that will size an onsite generation efficiently. And then if that efficient siting occurs, and there's some excess generation that needs -- that happens as a result, a place to be able to put that power. And be able to be paid for that power.

Essentially promoting what we call thermal match. And we can get into that later if you would like. But essentially being able to maximize the usage of the waste heat from these facilities. So, as I said, allow a facility to sell excess generation.

Just to kind of give you a broad overview, we started this procedure back in June. In early February staff released kind of a straw proposal, a draft proposal of here's what we think this might look like.

Parties had the opportunity to kind of

comment on it a little bit, and we held a workshop at the end of February. We then recently released another ruling just kind of updating the schedule. I'll get into what those updates are looking like.

We are collaborating with the Energy Commission both on some of the technical details, some of the technical guidelines. And also just some of the other terms and conditions. They are collaborative staff with us and really trying to make certain that we're trying to get this right.

I think, as everyone in the room knows, California is relatively new to the idea of a feed-in tariff in general. It's something that's been out there, but we're really trying to make certain, how do we design a feed-in tariff that's accurate and that makes sense. How do we design it for both renewables, which is happening right now, and how do we also adopt whatever the kind of a model that's sort of more out there for renewables, and how do we adopt that for something like CHP.

So there's a lot of very kind of interesting dynamics right now and trying to kind of work on that as best as we can.

As Linda mentioned, there is a second

part of what AB-1613 asks us to do, which was to develop a pay-as-you-save pilot program. The thinking on the PUC's part is we really want to know what this tariff is going to look like, what this feed-in tariff is going to look like; what are the terms, what are the conditions, what's the money out there, what's the potential?

And we wanted to establish that first before we kind of then develop a pilot program on top of it. So the way that the order is going that we're going to develop the tariff first. And then once that's developed, then we'll do a pay-as-you-save pilot program.

The pay-as-you-save pilot program, by the way, was modified by AB-2791 to include not only nonprofit organizations, but all state, local and federal government buildings within the state, as well. So, just a minor modification.

For those of you who are not familiar with the PUC kind of rulemaking procedures, it's a slightly different crowd. I put at the bottom there our rulemaking number. I encourage anyone and everyone to participate with our process. We try to be as open as possible. So that number is there.

As I mentioned, the PUC having the initial staff proposal for a feed-in tariff introduced in 2009, what would this contract look like. And really we kind of wanted to -- there are four areas that I think were really important for us to understand.

One, what would the price be paid, you know, for every megawatt hour, how much do you get paid for it. Probably the most important. But also trying to look at some of the interconnection issues since we're dealing with facilities that are -- less and less, can we just do an interconnection at the distribution level. Does it need to be at the transmission level. What would it look like for each, trying to understand some of those rules.

Since the goal of 1613 was to really maximize waste heat utilization, or put another way, to reduce greenhouse gases, -- suddenly put into play in a way that hasn't yet been done for combined heat and power facilities. Not saying that it couldn't or shouldn't, it just has not yet been done.

And so really trying to understand well, what are the role of these greenhouse gas

emissions, since it is both an emitter and an emission reduction strategy. Trying to define that a little bit better.

There's some other miscellaneous terms and conditions that needed to get streamlined, as well, to make this hopefully be as easy as possible to design for a feed-in tariff.

I would say probably from where our straw proposal was, that's the one where we probably have the most simplification that we can still do, and the most potential to really try and streamline. But it's what's out there now. As I've mentioned, parties submitted comments and the PUC did hold a workshop on it.

A point of clarification on this, because I do think there is confusion amongst the parties, confusion within the building at the PUC, confusion just kind of out there.

A CHP facility that signs up for a feed-in tariff like this does not need to sign up to be a qualifying facility. Does not need to be a QF, a qualifying facility. Kind of very important. I kind of underscore that. Because there is facilities like this up until this feed-in tariff opportunity came up, the only way that a small new

CHP facility would be able to do anything would be through a QF program.

This is now another option, another alternative. So the ramifications of that is that since the CHP facility that signs up for this feed-in tariff does not need to be a qualifying facility, the pricing structure and some of the other terms and conditions do not need to be the same as qualifying facilities program pricing or other structures.

Simply put, just because we already have a QF program out there, it's -- if a facility wants to sign up to be a qualifying facility, they can go that route. If they want to sign up to use the feed-in tariff, it's a different alternate route.

To the Energy Commission's credit they released in 2008, I believe it was September 2008, a very interesting report on feed-in tariff program options, policy designs. I put the CEC report number there. It's well worth taking a look at, especially it gets into this point of well, what would a pricing structure for a feed-in tariff look like if they were a qualifying facility, or if it were something else. And I

refer you to that report to kind of get into some of the interesting info that's there.

The topics that are currently be considered with respect to 1613, the feed-in tariff, that we're really trying to get into, I've already covered some of this.

Some of the miscellaneous terms and conditions, what's the product that I'm actually signing up for, that I'm actually buying. If I'm a utility, that I'm actually selling, if I'm a facility. Really trying to understand that so that it can be, you know, something that you can just sign up for, and doesn't have to get negotiated out. Pricing.

A question that we're still trying to determine is the ranges from essentially zero up to 20 megawatts, there's been a lot of feedback from the community saying we might need something even simpler for the really small units. From, you know, perhaps less than 5, even perhaps less than 1 megawatt. And that number has not yet been determined.

But the question that is out there is do we need to create one feed-in tariff kind of for everyone, and then perhaps even a further

simplification of things. You know, there's a real difference if I'm signing up with a 100 kilowatt facility as opposed to a 10 megawatt facility. And so just really trying to look at that. And that's something that is still definitely open for debate.

AB-1613 has within the language of the bill a concept of indifference. The customers who sign up for it or don't sign up for it need to be held indifferent. So if I choose not to sign up for 1613, if I'm just another customer, is there a way that I can be held indifferent with regards to this tariff.

We've put out a ruling, I believe, last week trying to really solicit some information saying what does this idea of indifference mean with respect to a feed-in tariff, how can we do that in a very defined way.

In a very similar matter, the definition of what is or is not a benefiting customer. Signing up for a feed-in tariff and reducing greenhouse gases can result in benefits that are probably just beyond the actual person signing up for it. And so really trying to understand the scope of what is and is not a benefiting customer.

There was a lot of very interesting feedback given to us. If we're trying to come up with a new program, do we want to set a total capacity cap first. For example, you know, X number of megawatts, 500 megawatts, 700, you know, 1000 megawatts, I'm making the number up off the top of my head, but something to try and see, all right, well, is this program -- have we gotten all these things right.

If nobody's signing up for it, does that give us an indication that we need to go back and revise. If too many people are signing up for it, did we make it too simple. Is there lessons that we can learn from it. So trying to kind of build in a step into that process if we need to.

And I will also say that there's a lot of, as I mentioned before, there are other feed-in tariffs being developed at the CPUC right now for in the renewable context. And there's a lot of very overlapping issues. And quite frankly, I think we want to make certain that we're doing it consistently across all the different topics. So there is a lot of coordination that is going on behind the scenes.

Just to give you a sense of timeline of

kind of where we are, and this is still all very rough, as the process goes. We released a ruling at the beginning of April saying, with an updated schedule, and I can refer anyone to that if you want the exact kind of timeline of where things are at.

But the idea was there was a couple of issues that frankly the parties just wanted, had asked for. We want to get together kind of on our own and be able to talk about some of this.

Certainly I think the three utilities will be able to benefit from getting together so that there can be one tariff that's kind of universal for them to be able to sign up for.

Some of the other parties may or may not want to be able to also kind of get together. So the opportunity for the month of April and going into May just a little bit, to be able to negotiate on their own.

There will be a filing of kind of proposed revisions off of the staff proposal that we filed in February. That will happen on May 15. Comments on that will then happen from into May and to June.

Energy division and myself, because I'm

not actually technically in energy division, will review everything that's on the record, both the staff proposal and all of the parties' comments on that, plus the workshop, plus the revised proposals, plus all the comments on that. And put out a final proposal on that.

There will be some sort of proposed decision that will happen in the fall, and we'll have a decision well, you know, knock on wood, well before our January 1 deadline. Just kind of a very rough timeline, but just to kind of let you know what's going on with that.

MR. DAVIDSON: The -- on that last slide, though --

PRESIDING MEMBER BYRON: Keith, --

MR. DAVIDSON: Oh, I'm sorry.

PRESIDING MEMBER BYRON: Mr. Colvin, if you'll take questions now, or at the end --

MR. COLVIN: I have one more slide to go, if you don't mind --

PRESIDING MEMBER BYRON: And we welcome your questions, but you'll need to come up to the podium and identify yourself.

MR. DAVIDSON: All right.

MR. COLVIN: I have, I believe one,

maybe two more slides. So let me just finish up. That way I won't lose my train of thought completely.

As probably most people in the room have heard me say at least once before, back in October 2008 the Energy Commission and the CPUC, together, filed a series of joint recommendations to the Air Resources Board on our greenhouse gas strategies.

And we looked at combined heat and power, both as an emitter and as an emissions reduction strategy. And feeding in with what the scoping plan says with the 6.8 million metric tons goal reductions saying that, yes, we recognize CHP as an emissions reduction strategy, but we need an updated policy framework to try and fit this into where our current levels of CHP are, and where we need to get by 2020.

And a feed-in tariff -- I apologize before I go down too far, the decision number of where that was, at least from the PUC lingo, is also there for your reference in case you haven't seen it before.

A feed-in tariff will be a part of this framework. Whatever we're designing, a feed-in tariff will certainly at least coordinate, if not

complement, whatever it is that we're developing. And it will be kind of part of that strategy. So I wanted to just kind of highlight that.

Here's how this feed-in tariff that we're really talking about today is going to fit into kind of the larger framework of things.

This new what we call an order instituting rulemaking, this new policy framework update on these issues to achieve this target -- scoping plan, kind of other policy drivers, as well.

Hopefully will be -- not hopefully, will be developed most likely mid this year through 2010, kind of the policy framework. And then implementation of it will occur in 2010. Just kind of a very rough timeline. I mention this a little bit, also, at the ARB's hosted working group meeting last month.

Just to give you a sense, again, of how a feed-in tariff will fit into this larger idea. The feed-in tariff is really limited to a small facility that is new or repowered. So we're not really discussing, at least today, existing facilities that haven't been repowered in a substantial way, or facilities that are larger

than 20 megawatts.

There might be some additional questions because that 20 megawatt border is kind of a narrow border. But just wanted to kind of mention here's how this feed-in tariff fits into the big picture.

And I believe that's my last slide. My contact info is there. Please feel free to email me, call me. I'll be here, also, all day. And we can open up for questions right now. And thank you very much.

PRESIDING MEMBER BYRON: Mr. Colvin, --

MR. COLVIN: Yes.

PRESIDING MEMBER BYRON: -- I'll go ahead and give you some immediate feedback if I may, and then I'll ask if there are any other questions.

First of all, thank you very much for being here. We have not had an opportunity to meet, but I'm very impressed with what I heard in your presentation. And really want to acknowledge your understanding, the PUC's understanding, of this subject area. I think it's improved substantially. And that's good.

But I also want to acknowledge the

efforts that the PUC needs to make to balance all the various interests involved here. And I think you've done that very well. I was very pleased when I saw this presentation at the end of last week.

But, if I may, just a couple of comments and maybe a question or two. When you talked about the feed-in tariff does not need to be a qualifying facility, does that mean that there's no need for a standard offer contract? In other words, they don't have to sign a contract?

MR. COLVIN: Let's be very very clear because I don't want to get into trouble while I'm on the record.

(Laughter.)

PRESIDING MEMBER BYRON: We're very informal here, Mr. Colvin, --

MR. COLVIN: Yes. No, no, I know. I thank you for the -- the way that a feed-in tariff will ultimately work, something will need to be signed saying, yes, I'm signing up for this tariff.

PRESIDING MEMBER BYRON: Okay.

MR. COLVIN: And that will be a contract. And it will probably be a one-shot

contract. And it will most likely, for lack of a better term, be a standard offer contract. But in order to not confuse ourselves with the qualifying facility program, it will not be the QF standard offer contract. We're just going to call it a feed-in tariff that just happens to be a contract.

There needs to be something that you physically sign, but I do not want there to be the confusion that just because I'm signing up to be a feed-in tariff -- a CHP facility that is signing up for this feed-in tariff, I do not necessarily need to register to be a qualifying facility through FERC.

All the rules that were under PURPA do not apply --

PRESIDING MEMBER BYRON: Understood.

MR. COLVIN: All of our pricing that's done under SRAC does not transfer over.

Does that --

PRESIDING MEMBER BYRON: Right.

MR. COLVIN: -- distinguish that for you?

PRESIDING MEMBER BYRON: Absolutely.

MR. COLVIN: Excellent.

PRESIDING MEMBER BYRON: And, of course,

this is a key issue and I hope there's others here that will speak to this, I asked staff for a copy of a standard offer contract, and they only gave me the first 50 pages.

And it doesn't take long thumbing through this to see that it's really terms and conditions that become the onerous part of this approach. And so I hope there are others that will speak to this.

I'm also glad to see that you've put at the top of your list terms and conditions are an important part of how we figure this all out.

MR. COLVIN: Right. And also to just clarify, at least the way that we did it on our kind of straw proposal that we released in February, we really only went through and for convenience sake, and I think this is where some of the confusion came from, knowing that a new qualifying facility contract was coming out, rather than reinvent the wheel completely, since so much of that contract is specific to combined heat and power issues, we did decide to start with that as kind of a template, as kind of the boilerplate; strip out a lot of the things that we thought were QF-specific; put in some new changes;

and kind of evolve that contract from there.

So, as a result there was a lot of kind of the back part of the contract that were the addendum, the definitions, things that just didn't get updated because we were really focusing on the terms and conditions.

The actual staff-proposed contract, that straw proposal, was really, I think, about 20 pages in length. It was not -- and I do think there is room to streamline it even further. And hopefully that will happen by the end of the year.

PRESIDING MEMBER BYRON: Well, and I don't want to emphasize the number of pages.

MR. COLVIN: Yeah, no, I know.

PRESIDING MEMBER BYRON: I mean it only takes a sentence or two to make a contract untenable.

MR. COLVIN: Yeah.

PRESIDING MEMBER BYRON: And so those terms and conditions are extremely important. I hope that other parties will speak to some of these issues, and I'll leave it to others to bring up specifics around those.

You know, I'm going to forego my other comments. I guess I'd like -- I noticed when I

came in that there are some members of the Air Resources Board that are also in attendance today.

I'm not sure if they're on the agenda, but I'd certainly like --

MR. COLVIN: I believe they are.

PRESIDING MEMBER BYRON: They are? Okay, good. But I'd certainly welcome to hear from them, as well.

Let's open it up and see if we have any other questions. Mr. Davidson, you spoke up earlier, so we'll give you first crack. Please identify yourself.

MR. DAVIDSON: Yes, Keith Davidson, DE Solutions. And my apologies for breaking protocol.

Two questions for you, Michael. One, on the timeline that you had up there, you mentioned that there's a deadline that the decision be reached by the end of the year.

I'm just wondering how firm that deadline is, and you know, what happens if we don't make it.

MR. COLVIN: The world's going to be sucked into a black hole.

No, in all seriousness, I think it's

certainly the target. I think -- I have every kind of reasonable expectation that at least the release of the feed-in tariff, itself, will be done well before the end of the year.

I'm slightly less confident in saying that when it comes to the second half of developing the pilot program, just because I don't want to commit to that yet.

I think it has a shot. I think it has a very good chance of being done before the end of the year. I wouldn't have said it if I didn't think that would be the case.

What happens as a consequence, we started our proceeding June 2008, and we typically like to have things go for 18 months and no longer. And so, that's another reason why I kind of put that end of the year deadline out there.

MR. DAVIDSON: Okay, just speaking --

MR. COLVIN: Is that a good nonanswer for you?

MR. DAVIDSON: Yeah. Well, that's good. I mean, speaking for kind of the smaller end of the size spectrum, we don't have a lot of resources to do this. And we've been through a couple other proceedings that have just dragged

out and dragged out and dragged out. I mean, the people just can't afford it. And I hope that you can stick with it, so --

MR. COLVIN: I not only empathize and hear you, but I'm, again, saying it in a very public forum. I do think it's very possible to get this done by the end of the year.

MR. DAVIDSON: Okay. If I -- can you indulge me for my second question?

PRESIDING MEMBER BYRON: Sure.

MR. DAVIDSON: One of the companies that I work with currently has a combined heat and power plant that was existing pre-AB-1613 that's already in excess of 20 megawatts.

And they're planning to put in another unit, a third unit, which would be less than 20 megawatts. And the question is, would that incremental unit be eligible to participate in AB-1613.

MR. COLVIN: To -- I'm going to give you an answer, but I'm going to give it with the caveat that I need to go back and check and make sure. So, this is not a hundred percent official.

I believe that the answer is, it is yes, it's the 20 megawatts, not facilitywide, but

unitwide. I believe that that's how that it works. Somebody else in the room can scream at me if I'm saying something horribly wrong, but I don't think I am.

I believe that to be the case. Let me go back and double check with our judge and I'll get back to you. But I'm fairly confident in saying yes.

PRESIDING MEMBER BYRON: Thank you. Any other questions? Please.

MR. LEIBOWITZ: Good morning. My name is Hank Leibowitz, Waste Heat Solutions.

Michael, would you confirm that a generator that only uses waste heat, doesn't use any fossil fuel at all or any kind of fuel, qualifies as CHP under this program?

MR. COLVIN: You mean so under a bottoming cycle type application?

MR. LEIBOWITZ: Yes. Without being part of a fossil fuel engine.

MR. COLVIN: Um-hum, I -- yes. Yes, it does.

MR. LEIBOWITZ: Good. The second part, which is sort of a segue, I understand --

MR. COLVIN: Well, now that I've said

that, as long as it meets the CEC's technical guidelines. But, yes.

MR. LEIBOWITZ: Well, in terms of 60 percent efficiency, a guy named Carnot says you can't do that. If you're only burning electricity, if you're only using waste heat you can't have 60 percent conversion efficiency by the second law of thermodynamics.

I don't want to get into that now, but we have to relax that or look at that for waste heat only applications.

MR. COLVIN: Again, I'll defer a little bit to where Art's presentation gets in, but I will acknowledge, at least from my perspective at the CPUC, I recognize that sometimes a bottoming cycle waste heat capture unit that you're describing is a slightly different animal than a topping cycle application, which is what most people think of when they think of CHP.

Barbara Barkovich is smiling over there, because she has drilled this into my brain of how different those two are. And I'm certainly well aware of those differences.

And it's certainly my intention, I believe the CPUC's intention, that both will be

able to have the tariff for it.

I agree with you that there are some probably subtleties and differences that will need to happen for the technical guidelines, but I wanted -- I don't want to step on Art's toes when I get into that. So, --

MR. LEIBOWITZ: Okay. Just is the FIT and a proposed SGIP that would include waste heat mutually exclusive?

MR. COLVIN: For everyone else in the room who -- on the phone, who didn't understand all those different acronym soups, FIT is a feed-in tariff, and SGIP is a self generation incentive program.

There hasn't been an official determination yet whether or not you can receive an upfront payment from the self generation incentive program. And then sign up for this feed-in tariff. We haven't determined it one way or the other yet.

In all honesty, as it currently stands, and this is, of course, always pending to legislation, there are no CHP facilities with the exception of fuel cells that are currently being offered incentives through the SGIP program. So

it is slightly a moot point.

If that legislation changes, you know, I know there's a proposal out there this round of legislative cycle that that could happen. We'll have to revisit it.

So, it's, again, one of those things where it's sort of like we can talk about the principle of it, that in effect any current program, any current facilities that have signed up to receive a self generation incentive program have already been funded. And they're probably no longer considered at this point. So it's a little bit of a -- kind of like I said, it's a little bit of a moot point.

If the legislation changes, I don't want to commit one way or the other at this point. I certainly see the arguments going both ways. It, frankly, will depend on what the price sense of being on the feed-in tariff and what the product is and is not, as it's been defined. And to see if there is too much overlap with the SGIP program.

MR. LEIBOWITZ: Thank you.

PRESIDING MEMBER BYRON: Mr. Leibowitz, good --

MR. COLVIN: It's a pleasure to have met you, sir. I've not yet met you before.

MR. LEIBOWITZ: All mine.

PRESIDING MEMBER BYRON: Mr. Leibowitz, good questions. And good answers. These are -- they become esoteric issues to some extent, but they're not, you know. The bottoming cycle issue is an accounting issue that we need to take care of, and the involvement in SGIP, the self generation incentive program.

This Commission is certainly in favor of seeing natural gas return to the SGIP. And we're hopeful that there'll be some more legislative action there, as well.

So we need to figure these things out. So we appreciate that. Haven't you taken your classes, though, in thermodynamics and understand all these? Sound like you do now.

MR. COLVIN: I will admit that I'm a economist by training, and I have a policy degree. And, so thermodynamics is luckily not something that I have to get too much into. But I do have a little bit of a physics background.

PRESIDING MEMBER BYRON: You certainly do. I'm glad to see it.

MR. COLVIN: So, --

PRESIDING MEMBER BYRON: Any other questions for Mr. Colvin?

MR. COLVIN: Well, excellent.

PRESIDING MEMBER BYRON: In that case I'd just like to say --

MS. KELLY: Are there any questions on the phone?

PRESIDING MEMBER BYRON: Oh, yes. No questions on the phone.

I'm really glad, Mr. Davidson, you brought up this issue about participation in the proceeding. We're concerned about that, as well. The smaller generators obviously are struggling, if you will. And customers really aren't represented here except through some of the vendors that may participate today.

But we're concerned about this, as well. And I hope that some of the others that are present here will speak to this issue. It's somewhat of an unrepresented sector, at least on the small end, the small size. And it raises a question, what comes first, maybe, the chicken or the egg.

MR. DAVIDSON: Right.

PRESIDING MEMBER BYRON: This sector, this combined heat and power distributed generation, distributed -- resources sector has been struggling for a long time. And I think we have known that many of these electrons pass through San Francisco, and that we've got to get this figured out.

But they don't all. And there are some good examples of CHP projects that are being developed in municipal service territories. And we need to pay attention to those, as well, --

MR. DAVIDSON: Right.

PRESIDING MEMBER BYRON: -- with significantly lower rates, those are made to look attractive financially and/or it's what customers want.

So I think part of that, we need to keep that in mind, as well, because that's part of what we're trying to do, is open up this market opportunity because it certainly has been closed or capped, to some extent.

Mr. Colvin, you wanted to add something?

MR. COLVIN: I wholeheartedly agree with you, for the most part. It's certainly my belief that we -- I'm going to use an analogy similar to

the solar experience. It's not a perfect, but it's somewhat similar.

You need both the utilities, you need the people who are actually putting these facilities on their location. And then you also need the manufacturers, the people who are actually building those things. And you kind of need that triangle of people in order to understand the full dynamics of what's going on here.

And I think especially at the lower end of the scale, the representation is not going to be done by the utilities or by the people who are necessarily putting the facilities onsite. But it's going to be done through the manufacturing community.

And that's going to be a trick of, okay, if I build it, you know, here -- here's how you would have to go and build it, and here's the tariff that you would sign up for. And let me understand it all at once.

And I would hope that the manufacturing community is also aware of this process. But I do think you need all three to be participating in order to have success occur.

PRESIDING MEMBER BYRON: You show a good understanding of all these issues. I'm glad that we have you at the PUC.

MR. COLVIN: Thank you.

MS. KELLY: Thank you, Michael.

Our next speaker --

(Pause.)

PRESIDING MEMBER BYRON: So I hope you will, Mr. Colvin, I hope you will be able to stay with us for the rest of the day. Good.

MR. COLVIN: Yes.

(Pause.)

MS. KELLY: Sorry; I'm just not really good at this job. Commissioner Byron, our next speaker is going to be Art Soinski.

And while I'm up here I would like to also just let everybody know that our team has -- the gentleman that was just here and leaving, that's Galen Lemei. He's our counsel. And in the back of the room Pramod Kulkarni, would you raise your hand? And here's Galen, again.

Along with Art and myself, this is the CHP team. We're looking at, we're doing AB-1613, but we're also working on the IEPR. CHP is going to be an important issue in the IEPR. And so

we'll be working on all things CHP over the next year. So I just wanted to introduce the rest of the team here.

Going forward, the next presentation is going to be by Art Soinski. Art is going to go over the background, the self generation incentive programs and some of the things that he looked at before putting together the recommendations for these guidelines.

So if you could just hold your questions while he goes over the background, and then as I indicated earlier, slide by slide we'll be glad to take your questions as they come up with regard to each of the standards.

So, Art. I think I can get this up here now. There we go.

(Pause.)

DR. SOINSKI: Good morning. It's really a pleasure for me to be working on AB-1613. I think it's really great legislation. And the reason I say that is for most of my career, getting on to 30 years, I've been involved in technology characterization, research, development and demonstrating funding. And trying to get technologies, especially distributed generation

technologies, into the marketplace.

And for several years I was on the environmentally preferred advanced generation team of the Public Interest Energy Research program, directing a group that was really trying to promote primarily combustion technologies, although we did some fuel cell work, also.

And about four or five years ago it became pretty apparent to me that combined heat and power was the way that distributed generation was going to take off in the state if it was going to take off at all. Because of the improved value that it offered in terms of efficiency and greenhouse gas mitigation.

And to my mind, you know, doing a pure electric, and Hank Leibowitz brought up the point of, you know, the Carnot cycle won't give you 60 percent. I don't know if that's really true. I guess it depends on what your high temperature reservoir and what your cold temperature reservoir are.

But certainly it is true that if you take the Stirling engine as an example, which is something, one of the technologies that we've been looking at in the PIER program, you're usually

below 40 percent. And the reason for that is you don't have materials that can give you the sufficiently high temperatures on the hot end to get it.

But then, of course, that's just one aspect of it. There's also the using the waste heat, or using the heat prior to generation for thermal needs, in which case potentially you could use that.

So, I guess I'd have to go through that calculation. Very interesting point, Hank, and I'm really glad you brought it up.

So, like I said, I think it's great legislation because it is actually a way of getting CHP to market, which is something I'd really like to see.

And so I took on this job. I didn't realize what it was. It's a lot different than anything I've been doing before. Creates a whole new set of challenges dealing with lawyers and utilities, and much less with the private sector, combined heat and power developers.

This is a topical outline, talk about the development of the guidelines, the process and the objectives that I had in doing this, and the

struggles that I've gone through and continue to go through, as has Michael Colvin at the CPUC.

The characteristics of an eligible combined heat and power system, and a generator, the customer, itself, as in AB-1613. Heating value definitions, the difference between high heating value and low heating value, and whether we target 60 percent as the minimum on a higher heating value or lower heating value does make a difference.

The self generation program, because it's a model in several respects. One of which is that it has dealt with distributed generation in combined heat and power. The other that it has evolved over time via legislation and decisions by the CPUC it has changed.

And I think probably what we're going to see with AB-1613 implementation is that there will be changes over time. Michael alluded to the fact, you know, what if you get more CHP than you thought, or what if you get less, what do you do. How do you self correct, or how do you correct.

And also there's even legislation right now from Senator Kehoe on this self generation incentive program. So it's a continuing process

of iteration.

And then the most important part, my staff proposals on performance metrics, what I call information requirements and calculations. Don't have all the calculations worked out in my head yet. Hopefully I'll get them down on paper within the next month.

And an issue that could potentially be contentious, I think, is how do you determine compliance. And if you have noncompliance, what are the alternatives that the buyer of the electricity might have. And what are the options that the owner of the combined heat and power system has.

So, development of the guidelines. I distinguish between the objective, which is to combine the system requirements, the CHP system requirements, that reduce wasteful consumption of energy. That reduce greenhouse gas emissions. And that facilitate more CHP installations.

And then the process that I went through was to address, one by one, the very specifics that are in the AB-1613 legislation. And I will go through those in terms of what I call staff proposals.

I looked at other legislation and other programs related to CHP and greenhouse gas emission reductions. And those are being addressed in part. You'll hear about the AB-32 process, which is very important, at the Air Resources Board.

And proposed regulatory requirements that meet the objectives of the act in terms of performance metrics, collecting and reporting various characteristics, including site load profiles to prevent independent assessments of the design and operation of the CHP system. And then performance verification to assure continued compliance.

One of the big questions that I have is will AB-1613 achieve the goals that it sets out to be. And will it achieve the goals that the ARB has in terms of greenhouse gas mitigation.

And I guess one of the things is you could either have, you know, a gold rush, or you could have a drought in terms of CHP implementation. And I really don't know, I can't predict. If someone has any perspective on that, I certainly would appreciate that.

One of the things is the performance

requirements of -- and Michael mentioned this -- doesn't automatically qualify for a feed-in tariff. There is a contract that has to be signed. There is reporting, at least in the draft there are forecasting requirements of electricity sales. And there's an insurance requirement.

On the positive side, there is, as Michael said, you can now design to the thermal requirements of the site without the concern about whether you have excess electricity or not. So this has important implications from both the design aspects of the CHP system, and the operational characteristics of a CHP system as the thermal-to-electric loads change throughout a day, or throughout any given temporal cycle.

These are the characteristics of a combined heat and power system. These are directly from the legislation. And my interpretation is that these requirements are set by law, and therefore there is no flexibility in terms of if there's a numerical specification, although there are some terms that certainly requires interpretation. And people could, you know, come to one side or the other.

In that case I've actually proposed a --

I've made proposals, and I'm anxious to get any comments that people have whether these are too strict or too lenient, and what the implications are of strictness or leniency in terms of achieving the objectives of the act, in terms of saving energy and in terms of actually getting greenhouse gas reductions.

The requirements -- has to be interconnected to the grid, either distribution level or transmission level. Is sized to meet onsite thermal demand, which is something that needs to be defined.

Has a minimum 60 percent efficiency measured as useful energy output divided by the fuel input at 100 percent load, at one point. One of the things I've been troubled by is how do you translate a 60 percent efficiency requirement at 100 percent load into an annual average efficiency number. And is there a requirement that should be put on that.

Meets NOx emission standard of .07 pounds per megawatt hour. For those of you who are familiar with the Air Resources Board DG certification program, this is a requirement that went into effect, I believe, January 1st of 2007.

There's also a particulate emissions standard in terms of their certification program. There's also a carbon monoxide emission standard. This legislation does not specify either of those. It's strictly NOx.

And if the system, the CHP system, meets the 60 percent efficiency, then the thermal output of the system counts toward meeting the .07 pounds per megawatt hour by making the standard conversion factor.

And then it meets a greenhouse gas emission performance standard. The number is not actually cited in the legislation, but it's the result of hearings and decisions made at the Energy Commission. I believe the PUC, also. Eleven hundred pounds of carbon monoxide -- or carbon dioxide per megawatt hour. As a chemist you'd think I'd never make that mistake between carbon dioxide and carbon monoxide.

Okay. And then so that's the system requirement. And there's also requirements of the generator, the owner. And it has to be a customer of an electrical corporation, so this is both investor-owned utilities and publicly owned utilities, that uses a CHP system with a

generating capacity not more than 20 megawatts.

And my proposal is that, you know, how do you measure the 20 megawatts. It's a nameplate rating, less parasitic electric loads that are needed to operate the generator, itself. That first commences operation after January 1, 2008, which is in the legislation. And uses a two-way time-of-use meter. So, those are those.

Heating value. Many of you know this, many -- well, I think probably most people know it, there's not always a distinction, but heating value is an old thermodynamic term that goes back long before the science of thermodynamics was established. But to the people who established the foundations of thermodynamics, by making careful measurements of gases and chemical reactions over time.

And it's really the combustion or oxidation of a fuel, I call it a chemical or chemical mixture, because it doesn't necessarily have to be something that's commonly used as a fuel. Under controlled conditions. So it's really a laboratory-type measurement.

The higher heating value is the heat released when the products of combustion are

brought back to the starting temperature, which is room temperature, 25 degrees Centigrade. Under those conditions water is a liquid. And the heated vaporization is recovered from the heat that is released. And therefore, this gives you a value that's more generous, if you will, in terms of the heat content.

The lower heating value which is used in gas turbines and combined cycle plants, in terms of specifying their heating value, is the heat released when the water is in the vapor stage, some temperature above 100 degrees Centigrade, or 212 Fahrenheit. And all the other products are at the same temperatures. So this would typically be done somewhere around a temperature of 150 degrees Centigrade, that this would be measured.

Now, why does it matter, and why do people care about arguing about heating value? It's because there is a difference, about 9 percent, for natural gas between the higher heating value and the lower heating value.

And if you take the 60 percent requirement of efficiency in AB-1613, say that that's a higher heating value requirement, then that becomes 66 to 67 percent, on that order,

lower heating value of efficiency requirement.

And I note that it can be difficult when you're reading the literature and specification sheets to determine whether HHV or LHV is being used. And one of the things that was very surprising to me, including looking at FERC with respect to PURPA, is that the word energy and power were used interchangeably in terms of definitions. And they are definitely not the same to the engineer or the physicist.

So there is the common unit of the kilowatt hour and the common unit of power, which is the kilowatt.

Background. Why am I using the self generation incentive program as one model for preparing these guidelines? And the reason for that is when you look at the legislation in AB-1613, you look at the legislation for the self generation program, is that many of the languages that you find, the efficiency levels, the specifications are the same between the two. Obviously been communication and an attempt to provide some type of similarity between the two types of programs.

The stakeholders are the same. The CPUC

implements the SGIP program, or the legislation via decisions. The California investor-owned utilities administer the SGIP. They would be the buyers, one of the groups of buyers under the AB-1613.

The requirements for the SGIP are described in a series of handbooks, several of which -- just told that I was not really talking into the microphone, thank you -- which are publicly available historically and more recently. So you can actually track the requirements on the SGIP over time.

There's a working group which has not met recently, as far as I know. The Energy Commission is a member. And it has worked through a lot of the procedures and implementation mechanisms informally collaboratively in terms of the implementation of the SGIP.

And one of the things that's very important is that the effectiveness of the SGIP has been assessed in a series of administrative funded studies, or administrator funded studies. And under the AB-2778 the Energy Commission's evaluation of it. And that was the subject of a whole chapter of the 2008 Integrated Energy Policy

Report update.

So there's a lot of analyses, a lot of history on CHP and DG over the last several years reflected in the SGIP.

The history, basically, is started in the year 2000 under AB-270. There's some redefinition clarifications in 2003 by legislation under Leno. That legislation specifically sets a 60 percent, greater than or equal to 60 percent efficiency requirement based on the higher heating value.

Legislation by Leber, AB-2778, also sets a CHP requirement based on an HHV basis for CHP, and also allows electric-only DG to have 40 percent efficiency requirement. And it limited the SGIP to fuel cells and wind from January 1st of 2008 until January 1st of 2012. So right now CHP is not within the -- as eligible for receiving subsidies under the SGIP.

So, when you look at through December 31st of 2006, which is roughly four or five years of operation of the SGIP, 342 DG systems were installed, DG/CHP-based systems were installed; 165 megawatts of capacity, which is on the order of 30 megawatts a year. And that's an important

number to consider within the context of looking for 4000 megawatts of CHP under AB-32.

During the year 2006, that calendar year, fuel cells and gas turbine based systems achieved the 60 percent HHV efficiency requirement when internal combustion engines and microturbine-based systems did not. And that's one reason why I'm proposing that there be some reporting requirements and some load profiles developed under the guidelines for AB-1613, to assure that this situation does not occur in the future.

And I think there could be a lot of debate and perhaps there'll be some data presented by other people in terms of why is this, in fact, occurring. Why are these low.

And one of the things that was distressing to me is during 2006 the owners of nonrenewable, that is fossil-based fuels, had operation and maintenance costs, including fuel costs, that exceeded the electric bill savings, except for fuel cells. So, for the owners of the systems, CHP was not a good deal.

And with respect to the .07 pounds of NOx per megawatt hour, no CHP systems became operational under that requirement. They came

under requirement with .14 pounds of NOx per megawatt hour. So an interesting question is if that requirement is imposed, will there be certain technologies that will not be able to meet a .07 pounds of NOx per megawatt hour requirement with a CHP credit.

So, looking at these things, you know, it's somewhat relevant, these observations are somewhat relevant, but there is a difference. One is the size difference. Another is that the incentive for the SGIP was based on rated capacity rather than on energy output or what I call performance based payments.

And so I think a lot of the issues that arose during the SGIP would not apply under the AB-1613, because if there's no performance there's not going to be any payment for electricity, no production -- no sales.

So, that --

PRESIDING MEMBER BYRON: Mr. Soinski, just a quick question. MTG, is that methanol to gas, what --

DR. SOINSKI: That's microturbine generator.

PRESIDING MEMBER BYRON: Microturbines,

thank you.

DR. SOINSKI: On this slide it's in the first bullet.

PRESIDING MEMBER BYRON: All right, and --

DR. SOINSKI: I'm sorry, I got tired of --

PRESIDING MEMBER BYRON: No, I missed it. You're absolutely right, it's there.

DR. SOINSKI: -- writing out all these terms. And cluttering up the slides and violating the rules that we're not supposed to have more than what is it, nine words per bullet or something like that, which I --

PRESIDING MEMBER BYRON: All right, well, we won't count those.

DR. SOINSKI: -- which I violated many many times --

PRESIDING MEMBER BYRON: But there are some key points in here. I hope that some of the participants in today's meeting will be able to address some of these observations that you've made. Thank you, go ahead.

DR. SOINSKI: Right, yeah, I don't want to call these conclusions. I make a big

difference between conclusions and observations. I think these are just observations. Why do these things happen? What's the cause and effect? I don't know.

And if somebody has perspectives on some of these aspects, I'd really want to know. Because one of the concerns I have is how do we avoid having failures in a new program, if they were failures, or deficiencies in a new program that we had in an old program, you know, old program.

So, don't beat up CHP, it's my view, because some systems did not perform well in the past. Look at how we can make it better to insure that they perform well in the future going forward.

And that goes through about half my presentation. And, Commissioner, do you have any other questions? This is sort of, this is the background observations. Sort of trying to tell you where I'm coming from. And its transition to going forward where I'm now going to tell you where I've come down on the line one way or the other.

And hopefully get a lot of comments,

slide-by-slide, topic-by-topic on whether it's correct perspectives, disagreements as to, you know, where I've come down to really establish a better understanding on my part and everybody's part as to where we should be going with respect to specific requirements.

PRESIDING MEMBER BYRON: Okay. Then let's pause here for a second and take this as a transition.

DR. SOINSKI: Yes.

PRESIDING MEMBER BYRON: And, Mr. Soinski, it's great to have you on this program. We got a great team now that we've pulled together in this subject area.

I do not have any specific questions, but there's lots smarter people in the audience than me. Maybe they'll have a couple of comments or questions, and then we'll proceed into the second half of your presentation.

Anyone care to ask a question or make a comment? Please.

MR. LEIBOWITZ: Art, when you put 60 --

PRESIDING MEMBER BYRON: This is Mr. Leibowitz.

MR. LEIBOWITZ: Oh, I'm sorry, Hank

Leibowitz, Waste Heat Solutions.

DR. SOINSKI: We've met.

MR. LEIBOWITZ: When you indicate 60 percent heating value for a --

DR. SOINSKI: Yes.

MR. LEIBOWITZ: -- efficiency requirement for a 20 megawatt system, aren't you inviting developers to put in less efficient prime movers that have lots of heat in the exhaust with which you can capture and make process steam or something, but because the 60 percent bar is so high, it understates the value of electricity, if you bundle electricity and heat together? If you don't give electricity its due. Do you understand the point I'm making?

DR. SOINSKI: Oh, very definitely. You're talking what I would call second law --

MR. LEIBOWITZ: Yeah.

DR. SOINSKI: -- analyses versus first law analyses.

MR. LEIBOWITZ: So you're going to get a guy with --

DR. SOINSKI: Which I don't want to go into here. But, yes, you're correct. There's always an issue in my mind when you value

electricity and thermal energy, especially lower grade thermal energy, the same.

Right, is I think what you're saying?

MR. LEIBOWITZ: Yes.

DR. SOINSKI: Right.

MR. LEIBOWITZ: Was that an intended prescription here, to equate them as equals?

DR. SOINSKI: Well, I'll get to that specifically in the future when I define -- when I settle up energy output versus fuel input to calculate the 60 percent. And I imagine you've looked at that. And, yes, I am doing that. And I understand the implications of doing that from a thermodynamic standpoint.

And I understand also that that may push you in the direction of certain technologies as opposed to other technologies. Which raises a lot of interesting questions of do you have different efficiency standards for different prime movers. One way you could potentially address this problem.

And I'd like to hear, you know, comments from people as to what their perspective is, and how they would see treating this problem.

Frankly, I had enough problem getting to

the point I am today with just lumping all technologies together, compared to separating them out.

But, no, I do understand that there are different power-to-heat ratios, and that you can buy, as people, in one direction or the other by having a combined efficiency number where you treat electric and thermal equally.

MR. LEIBOWITZ: Thank you.

DR. SOINSKI: Okay. Does anybody have a comment on --

PRESIDING MEMBER BYRON: Ms. Barkovich, come on forward.

DR. BARKOVICH: Thank you. I'm Barbara Barkovich; I'm representing the Coalition for Sustainable Cement Manufacturing and the environment.

With respect to the slide you had on page 4, and I know this comes from the statute, but it has certain attributes that are alleged to be characteristics of an eligible combined heat and power system.

And the second bullet says it's sized to meet onsite thermal load. Well, that's a good topping cycle comment, but has nothing to do with

bottoming cycle applications.

And the last point, which has to do with meeting greenhouse gas emission performance standards of 1100 pounds of CO2 per megawatt hour, the Public Utilities Commission has adopted a standard there, but there's an outstanding petition for modification of that standard as it applies to bottoming cycle applications.

So, from those comments and some of my reading ahead, since we received these in advance, it seems to me that the analysis that's here is largely focused on topping cycle applications.

And would you -- I assume you would solicit comments on April 27th with respect to bottoming cycle? It seems to me that a lot of this analysis is not entirely apropos.

DR. SOINSKI: On April 27th -- oh, you mean the written comments.

DR. BARKOVICH: Yes. I mean I'm happy to give you oral comments today, but, as you know, I'm a one-trick pony here. I'm going to keep talking bottoming cycle, aka waste heat recovery. We have an alliance here I've just discovered.

DR. SOINSKI: You found a friend. Well, we've, of course, talked informally over the last

few months. And it's what do you do when you've got legislation that directs you to something.

And, you know, if someone has specific suggestions, which is, I think, one reason why we're here talking to the Commissioners, or before the Commissioner, is, you know, what can we do potentially to correct these things.

I don't know that there's -- to my mind when there's a legislative requirement I don't see that I can, you know, interpret -- I guess we might, you know, say are you a strict constructionist or, you know, loose. And I'm not a lawyer and I'm certainly not a constitutional lawyer.

But if, you know, it may be that there should be some change in the legislation, you know, or, you know, other remedies that could be provided in terms of addressing the needs of bottoming cycle industries, as opposed to topping cycle industries, yes.

DR. BARKOVICH: Well, I can certainly talk to Assemblyman Blakeslee. I don't have any problem with that. But, it seems to me that if a decision is going to be made here, that the entire structure will be based on topping cycle because

of the limitations of the language in the statute, I would like to know that sooner rather than later so I can take whatever action on behalf of my clients as appropriate.

I mean, as you and I have discussed, it's not even clear to me that they're intending to sell any electricity. I think they're planning on using it themselves.

But there may be other waste heat recovery applications where somebody would want to sell their power. And if somebody's going to make a legal determination that it's precluded by the statute, then the sooner we know that the better, so we can talk to the author.

Thank you.

PRESIDING MEMBER BYRON: Yeah, thank you, Ms. Barkovich. And in Mr. Soinski's defense, he's not --

DR. BARKOVICH: He's not a lawyer.

PRESIDING MEMBER BYRON: -- yeah, he's not an attorney, nor is he the one that'll make this determination. But I think it's incumbent -- the answer to your question is yes, we are interested in your written comments on this subject. I think they can be very helpful.

And we can certainly address legally what's required and what we can do to address this bottoming cycle, or waste heat recovery issue within the confines of the existing legislation. Because it's very possible that the author did not think about this when he had this. But he's very approachable. And so we'll get to the bottom of this. But we certainly want your comments and input as it applies to the waste heat recovery.

I think we have another question. Would you come forward, please?

MR. WICHERT: Hi, Art. My name's Robert Wichert; I'm the technical director of the US Fuel Cell Council. Nice to meet you, Commissioner Byron.

I also, in the interest of full disclosure, am the chairman of ASMEPTC 50, and I'm also the secretary of the California Alliance for Distributed Energy Resources. So, just full disclosure.

This is a fuel cell council comment, if I could. In listening to Hank Leibowitz, I think I want to try and take it to the illogical extreme. And he's right. If you had a boiler, the efficiency might be quite high and you would

make no electricity at all.

And so I think we need to think carefully about our efficiency requirements for these combined heat and power systems, and insure that they do provide a high level of combined efficiency, and not just heating efficiency.

That's really all I have right now. Thank you very much.

PRESIDING MEMBER BYRON: Thank you.

DR. SOINSKI: Yes, you can get on the order of 80, 85 percent efficiency from a boiler, depending on whether producing steam or hot water, for example, if you look at standard spec sheets from a packaged boiler manufacturer.

So, yes, I, again, I understand the point.

PRESIDING MEMBER BYRON: Let me ask, there were two observations in Mr. Soinski's slides. I'd like to ask does anybody in the audience wishes to address, just because this seems to be a good time to do it, if you will, on page 10, down near the bottom of the presentation. It says during 2006 CHP system owners nonrenewable fuel O&M costs exceeded electric bill savings, except for fuel cells.

And then the other one that no CHP systems became operational under the .07 pound NOx per megawatt hour requirement.

Are these indeed correct? Would any of the participants in the audience care to address either of these observations?

I won't be offended if you don't. Mr. Wong?

MR. WONG: Eric Wong with Cummins Power Generation, and also the chair of the California Distributed Generation Coalition, which is comprised of manufacturers and developers and consultants.

I want to address actually the three, the bottom three of those, which includes yours, Commissioner Byron.

I think on the second bullet it says that again using nonrenewable fuels that fuel cells and gas turbine systems reach the 60 percent, but not ICE, internal combustion engines and microturbine generators did not.

I think you're talking about digester gas, right? But we need a little more data on that; we can interchange -- I'm certainly happy to take information back to member of the -- which

includes Capstone Microturbine, and we have the various engine manufacturers. But we need a little more detail on that.

DR. SOINSKI: Okay, my reference for this, and perhaps I should have -- actually I forgot to prepare my resource slide. I'll have to do that for you.

This was an ITRON report that was done. I think it was called the Seventh Year Report. Which looked at 2006. And they, you know, compiled the data that they had. And it's an incomplete dataset. which is a problem.

And this was actually their observation. Okay.

MR. WONG: Okay, that's helpful.

DR. SOINSKI: So that's the source. And it's available, you know, if you just Google SGIP and go to the --

MR. WONG: Right, right.

DR. SOINSKI: Yeah.

MR. WONG: I have that report.

DR. SOINSKI: Sure, right. I'm sure you do.

MR. WONG: My other comment, in terms of the spirit of your request that, you know, we need

to have a, you know, better program, improve the program, you may be looking at a situation because you're dealing, if it is digester gas, with a fuel that needs to be cleaned up ahead of time.

And that presents certain challenges because it's different technologies. So for nonrenewable fuels, you may have to devise a different program, as opposed to, say, natural gas. Or methane. Well, methane usually goes into landfill gas type operations.

So, anyway, that's just something to think about. It's not a strong proposal on my part right now, but this begs that question.

DR. SOINSKI: Yeah.

MR. WONG: Because you're dealing with different types of fuels.

The second -- I'm sorry, the third bullet there, I can't answer that. That one's very intriguing to me. That literally wipes out, or puts you into a negative, is what you're telling me, Commissioner Byron. And --

DR. SOINSKI: That's correct.

MR. WONG: Is that from the ITRON report, also?

DR. SOINSKI: No. This is from the AB-

2778 report. It was a run done by TIAX --

MR. WONG: Yes, okay.

DR. SOINSKI: -- for the Energy Commission.

MR. WONG: Okay. We'll definitely try and get some written comments on that.

DR. SOINSKI: Because they did a -- well, they sort of looked at the participants, societal amount of participant tests. Although they didn't, the only one they really did to any degree was the participant -- so-called participant, which is the owner, I believe.

That, yeah, this was the case. And they actually included in the cost of the generation, but they didn't seem to, you know, the capital costs minus the SGIP payment. But they did not seem to amortize the capital costs.

And so they came up with even more negative numbers than if you just look at the annual, you know, operational cost.

But if I did it correctly, I think I did just take in the fuel costs, the O&M costs and compared that to what they calculate as the electric bill savings.

And it depends on whether you're -- on

how you allocate electric thermal and chiller, both heating and cooling, what your electric bill saving is. Because they made certain assumptions about the other, you know, the nonCHP system. And what the efficiencies would be, and what the cost of electricity would be to provide those services with the alternative, you know, the electric grid plus the electric-driven chiller.

But I don't think I've biased these reports. Now there's the whole question of the methodology of the report, which I'm not going to go into.

But I'm actually trying to provoke comments and interest and specifics so that going forward we can do things better than we have in the past. I mean that's really one of my objectives. Okay.

MR. WONG: My comment perspective, I would say, on the last bullet, no CHP systems became operational under the .07 pounds NOx requirement. I guess I would take that a little bit differently in looking at the -- that's for 2006, right? And the requirement, that requirement became effective 2007, January 1st?

DR. SOINSKI: 2007, right. What was the

year?

(Parties speaking simultaneously.)

MR. WONG: Is it January 1 or January 31st? Well, let's assume it's January 1, 2007.

DR. SOINSKI: I think -- okay, so I think the point here is during 2006 the CHP systems that came under operation came under the .14 pounds --

MR. WONG: Right, because --

DR. SOINSKI: -- NOx.

MR. WONG: -- that was effective. That limit was the effective limit.

DR. SOINSKI: At the time they applied, so even though they became operational in 2006, they came under the older --

MR. WONG: Right.

DR. SOINSKI: -- the more lenient NOx requirement.

MR. WONG: Okay, so my perspective is that the .07 deals with the period post December 31, 2006, and those that are in the queue in terms of receiving SGIP money, right?

DR. SOINSKI: Correct.

MR. WONG: So this -- you're not making the comment that post January 1, 2007, no CHP

systems became operational. Because a database doesn't exist for that. Or are you?

DR. SOINSKI: The database does not exist.

MR. WONG: Okay, so am I correct then --

DR. SOINSKI: Actually perhaps then explain this to the extent -- what my intent was here, is the question of will .07 pounds per megawatt hour standard limit the introduction of certain prime mover technologies in CHP systems, or will it be a significant restriction on CHP in general, regardless of what the prime mover is.

MR. WONG: My general response to you, and I'm going to get into more detail in the afternoon, because I think that may give us a better opportunity for interaction amongst the different people here, is that it would be no. It would not become a obstacle.

Thank you.

DR. SOINSKI: Historical perspective, when I was in the PIER program one of the things we had to deal with quite extensively was internal combustion engines. And getting them clean enough to meet South Coast requirements. And the difficulties that they have, especially in the

South Coast.

PRESIDING MEMBER BYRON: Mr. Colvin.

MR. COLVIN: Yeah. This is, again, Michael Colvin, for the benefit of everyone on the phone.

Not so much a direct answer to your question, but just I guess a point of clarification, since we are talking about the SGIP program, which I'm familiar with, not certainly an expert on.

But I think two points are worth noting especially with respect to those bottom two bullet points that you were mentioning.

The first is that SGIP is really just an upfront incentive payment. And it is not designed, nor does it actually reward performance. Very similar, again, to how the solar initiative once worked, where we funded solar through the SGIP program, and now through the California Solar Initiative, we had both expected performance and performance-based incentives.

And I think the hope from what we developed through this feed-in tariff is that you get paid on a per-megawatt hour basis. And performance will help that, and market factors

will help drive optimization of proper facilities. And so I think it's worth just kind of mentioning that.

The second thing that's worth mentioning that speaks, I think, a little bit more to the NOx point, the way that the SGIP program was first set up, and the way that it currently exists now is that there is a size capacity that there is -- you receive one incentive level payment for the first megawatt; for megawatts one to two you get a second payment. And from megawatts two to three you get yet the third payment. And your facility can be sized up to five, but you only get upfront payment for those first three megawatts.

And it could very well just be that upfront costs for putting in something like selective catalytic reduction, something of that effect, that the economics just don't work out with that particular pricing structure in that particular way.

I'm purely speculating at this point, but I just wanted to kind of mention that, that it might speak a little bit to that question that you had.

The last thing that was worth

mentioning, going back to the ITRON report, which is out there, one of the conclusions that it had for some of these smaller systems was that the way that the systems were set up is that they were, again, not designed to optimize really a thermal to electric ratio in the way that we're trying to do now with hopefully these new technical guidelines.

So, as we're looking to SGIP for kind of lessons learned, I think one of the lessons learned is we need to make certain that we are optimizing thermal and electric correctly.

One of the things that came out of that ITRON report, especially for the smaller technologies, is that if they were sited more efficiently there would be greater greenhouse gas reductions than were currently existing.

So I just wanted to, again, make certain of those clear to everyone in the room who may or may not be as familiar with SGIP. So.

PRESIDING MEMBER BYRON: Thank you. And, Mr. Davidson, if it's all right, I'm going to suggest, because I opened up this discussion, and I know Ms. Kelly's probably concerned that we get back on schedule.

There will be ample opportunity in the afternoon, and I welcome all your participation. I was very curious about those two particular observations.

And forgive me, Dr. Soinski. I knew that, and here I've been making this mistake all morning.

DR. SOINSKI: Oh, that's quite all right. I don't use the title Doctor.

PRESIDING MEMBER BYRON: If you would continue with your presentation, and try and keep us on schedule. You have a lot of material to cover here.

DR. SOINSKI: Steve, do we have anybody on the --

MR. SPEAKER: No, we don't.

DR. SOINSKI: Okay, fine. Then let's move on.

PRESIDING MEMBER BYRON: If there's questions on the phone, please interrupt us during the question-and-answer period to make sure we don't forget.

DR. SOINSKI: Okay, starting out with what I considered to be one of the more innocuous staff proposals, which is on the net generating

capacity, which is the full load continuous rated capacity of the generator at standard conditions, as packaged and delivered, minus any ancillary loads that are required to make the generator operable. And that that should be no more than 20 megawatts. Does anybody have a comment on that?

Told you it was going to be an easy one.

This is the -- we've already discussed this. This is the system efficiency -- well, we've had some comments, perhaps -- really discussed it. Sixty percent higher heating value basis, 100 percent load as stipulated in the legislation; standard conditions.

And the system efficiencies, the useful energy output over the fuel input. Useful means made available for use. And I'm frankly not sure I know exactly what that means. Except it is in both FERC regulations with respect to PURPA, and it has been adopted by the ARB.

And then the useful energy output is the net after the parasitic electric losses have been subtracted, related to the definition of net generating capacity. Plus the useful mechanical output.

So, for example, you could drive a pump

with steam, or with, you know, directly off the shaft of a prime mover. Plus a useful chemical output, which I put in for the fuel cell folks just in case it might come by sometime where they'd be producing a stream of hydrogen in conjunction with this.

Plus the useful thermal output. This is the gross thermal output minus the thermal input. And this gets into -- well, it could lead potentially, or it does lead into what do you define as a system diagram, and the boundary conditions, because it's really the heat coming out, and then the heat contained in the return water from the thermal user to the generating systems.

And then the fuel input is the quantity of heat -- quantity of fuel times its heating value, or heated combustion. All done in common units, using accepted conversion factors.

MR. LEIBOWITZ: What happens when there's no fuel?

DR. SOINSKI: When there's no fuel?

PRESIDING MEMBER BYRON: Can you repeat the question, please?

DR. SOINSKI: Okay. Hank Leibowitz

asked a question of what happens if there's no fuel, so that the fuel input is zero. I don't know, if you want to say mathematically -- you're talking about bottoming cycles.

MR. LEIBOWITZ: Yeah.

DR. SOINSKI: Right. And this gets back to that whole issue of the legislation and how we address it.

I guess you could say it's infinite, and since division by zero is undefined mathematically, and in which case I think you probably qualify. Is that an answer you'd like?

MR. LEIBOWITZ: Well, yeah, but --

PRESIDING MEMBER BYRON: Wait. It's really important that we not try and have conversation across the room, because it doesn't get picked up by the court reporter or those on the phone. So, Mr. Leibowitz, wear out your shoe leather. We're glad to have you at the podium.

MR. LEIBOWITZ: Yeah, Hank Leibowitz, again. If we take the legislation literally then bottoming cycles are not acceptable because of fuel input is zero and it makes all of the parameters, I guess, meaningless.

This appears to me that this legislation

wasn't considering bottoming cycles. And with all due respect to my colleague, Mr. Colvin here, it seems to me CHP maybe wasn't entertaining waste heat stand-alone systems.

DR. SOINSKI: So, where would you have the situation --

MR. LEIBOWITZ: I mean I would like to see these parameters reflect the fact that there are CHP systems that don't require any fuel. And in which case the efficiency, electrical efficiency doesn't have to be anything.

DR. SOINSKI: Where is the energy coming from?

MR. LEIBOWITZ: From a otherwise wasted stream in a stack of a cement plant or glass plant.

DR. SOINSKI: So, --

PRESIDING MEMBER BYRON: Dr. Soinski, I think we can address this, and we have not discussed this, so give us an opportunity to do so. It may be a limitation of the legislation, Mr. Leibowitz, but I can tell you that in this particular case we're fortunate. The author of this legislation does have a PhD in geophysics, but maybe not thermodynamics. So we'll see if we

can take care of this without having to write new legislation.

But I understand your concern, the concerns of others. I'm hopeful it's an accounting issue that we will be able to pick up.

MR. LEIBOWITZ: I hope so.

PRESIDING MEMBER BYRON: Dr. Soinski, do you want to add anything, or do you want to proceed?

DR. SOINSKI: I'll proceed, but I have to think about this a little bit more. But there is fuel input, and there is useful thermal output in terms of cement manufacturing. So maybe this equation can still be used. I'd have to -- I really need to think about it a little bit more. Okay.

Any other comments? Oh, yeah, that's right, Galen wanted to address Barbara Barkovich's comment earlier.

MR. LEMEI: This is Galen Lemei with the Energy Commission. I have the good fortune or misfortune of being an attorney, working on this project.

And I'm understanding and beginning to get a better sense of the potential limits of the

legislation in addressing the bottom cycling issue.

I'll be the first to admit that I have no degree in thermodynamics. But I just wanted to specifically ask the parties and especially Dr. --

MR. LEIBOWITZ: Hank is fine.

MR. LEMEI: Or Hank. Especially Hank and Barbara, and anyone else, that to the extent that you have input as to how the existing legislation could be interpreted by us in a manner that accommodates your needs, that's something that is specifically useful and helpful to us.

Obviously, as a state agency, we're limited by the language that we're given to work with. But we're very interested in working with the language in a way that accomplishes the most good possible. And clearly there's great potential in bottom cycling CHP.

So I just wanted to make -- put that specific request on the record. Thank you.

DR. SOINSKI: No comments on the phone? Any other comments here? Okay.

Next. Ways to utilization, and there are two aspects of this. One is going back to historical records, PURPA requirements and the

SGIP program requirements in terms of waste heat utilization.

And those requirements are that at least 5 percent of the facility's total energy output shall be in the form of useful thermal energy. This is a requirement -- both the first two go back, I believe, on the order of 30 years.

And the other is that the useful annual power output -- ah, there's that nasty word power instead of electric -- shall plus one-half of the useful annual energy output equals not less than 42.5 percent for natural gas. And here they use lower heating value basis, rather than higher heating value.

And typically the 5 percent under the SGIP requirement was easy to meet. The 42.5 percent requirement was not met by -- should remember this, I don't -- actually I don't have that in my notes. But then the real thing is how do you prevent de facto wholesale generation. And it relates to sizing to meet the thermal demand.

And I've toyed with this. I say shall be no smaller than the minimum connected onsite thermal load. And no larger than the maximum connected onsite thermal load.

I've been troubled, and Galen actually has been troubled by this minimum connected onsite thermal load requirement. And I don't know whether it's something that really needs to be here, or whether this requirement needs to be here at all.

And I'd be interested to find, to get the perspective on how we meet the legislation's requirement of preventing de facto wholesale generation. Maybe the electric utilities would have a comment on that point.

Or is this a serious issue? I mean this has not been a problem certainly over most of the -- within the context of the SGIP program, these requirements have not been.

Comments on that? Oh, let's get PG&E.

MR. WILLIAMS: Good morning; this is Ray Williams from PG&E. Thank you, Dr. Soinski, first for getting your presentation out ahead of time. I think it's certainly helped with the discussion today.

In terms of connected load, I wasn't aware that -- I don't really know what the definition of a maximum connected load or minimum connected load would be. It just would seem like

there would be one per site.

But in terms of the sizing question, we will get into this more in our comments. We view a facility, itself, should, at a minimum, before looking at what is the most efficient setup for a CHP system, should undergo an energy efficiency audit. In other words, sort of a mini loading order concept on a particular site.

And that audit be really around its whole operations. PG&E does not have a -- at this point have a proposal as to what to do with the audit. But we certainly think that the sizing question should be better informed by doing sort of a whole facility audit first.

Thank you.

PRESIDING MEMBER BYRON: Mr. Williams, while you're there, thank you for coming up to help answer this. I think really ultimately the question is why are we interested in trying to prevent de facto wholesale generation. What's the concern here? Is it some interest on the part of the investor-owned utility?

MR. WILLIAMS: I would say, first off, if you look at a utility portfolio, we, ourselves, follow a loading order. And we do so now in large

part to help reduce greenhouse gas emissions.

So if you're looking at one of the primary goals for this program is the reduction of greenhouse gas emissions, it seems like the best first opportunity would be to look at the efficiency of the operations onsite, the same way that the utilities look at the efficiency and the emissions intensity of its overall portfolio.

So, in terms of power injected onto the grid, I think we would have the same concerns that we would have with any power injected onto our grid as part of our portfolio. Is it priced properly for the product that we're giving? Does it help reduce greenhouse gas emissions or not with respect to our own portfolio? And does it support a reliable operation of the grid and of our own portfolio?

PRESIDING MEMBER BYRON: Well, with a 60 percent efficiency requirement on higher heating value I doubt that even on PG&E's system that you have, overall natural gas system efficiency in excess of 60 percent.

MR. WILLIAMS: So, I don't know the answer to that question. When I saw the efficiency I was scrambling with a little table to

try to convert that into heat rate. And look at that relative to a new combined cycle plant. And also to the 1100 pounds.

So I hope to have maybe a better answer for you on that question this afternoon.

PRESIDING MEMBER BYRON: Good, thank you. We'll come back to it then. Thanks for coming up.

Unless these are key questions we need to address right now, I'm going to ask if we'll let Mr. Soinski continue so that we can all get a lunch break. And we'll come back to more discussion. So, please, keep track of these issues that you want to bring up.

Dr. Soinski, let's proceed.

DR. SOINSKI: Okay.

PRESIDING MEMBER BYRON: And if you keep asking questions you're going to get answers. So you might want to think about that, and get through your presentation.

DR. SOINSKI: Can I -- I'm sorry.

PRESIDING MEMBER BYRON: Go right ahead.

DR. SOINSKI: Environment -- I'm sorry?

MS. KELLY: Just need clarification so that we can have questions --

DR. SOINSKI: Oh, okay. Linda Kelly has made, I think, a very productive comment. If you want to know where I'm coming from perhaps I should address that or attempt to address that as best I can now.

And then if you would like to see something different then this afternoon's session might be a more appropriate time to do that. Okay.

Environmentally beneficial with respect to CO2 emissions. This is in the legislation. And here what I said is, well, you basically do the CHP system versus the alternative. And the method I proposed to be used is that that's in this TIAX report. And here I have provided the references report which I have mentioned before. This is the AB-2778 requirement.

The big issue, and this is controversial at the CPUC in many different proceedings, and will probably remain controversial for a long time, is what does the electric generation system look like. What does the natural gas -- or what does the boiler look like for heating. And then what is, if you have combined heating and cooling, what does the cooling alternative look like that

you're making the comparison to.

And these are the numbers that I've come up with in terms of what needs to be beaten. And then I've taken the -- I've come up with an arbitrary number of 5 percent lower that the CHP system, or 5 percent better that the CHP system has to beat than what the alternative is. But then I think the devil is in the details of what the alternatives are that you're comparing the CHP system to.

I've struggled with this, as many other people have. Are there comments on this, Commissioner? No.

Michael, you -- oh, I didn't know whether you had a -- no comments.

PRESIDING MEMBER BYRON: I think we could well come back to some of these issues, Dr. Soinski later. I think we'd like to --

DR. SOINSKI: I would anticipate that these could be controversial.

PRESIDING MEMBER BYRON: Sure.

DR. SOINSKI: I thought that -- I really anticipated this would be.

PRESIDING MEMBER BYRON: And I think we will get a chance to come back to them, Ms. Kelly,

if I'm correct, this afternoon.

MS. KELLY: Yes, we have questions, I think, that go to all these issues.

PRESIDING MEMBER BYRON: Right, but --

MS. KELLY: And we can bring them up in comments.

PRESIDING MEMBER BYRON: But I think it would be good if you get --

MS. KELLY: Yeah.

PRESIDING MEMBER BYRON: -- through your presentation now. And --

DR. SOINSKI: Okay.

PRESIDING MEMBER BYRON: -- let's go ahead and come back to these issues and discussion.

DR. SOINSKI: The issue of what information you have to have. And one of the points that perhaps needs to be reiterated is that this is not just a tariff that people are going to get. There's information that has to be provided.

This is the type of information that was required under the SGIP in one form or the other. Some of it would be information that would be required under the AB-32 mandatory reporting guidelines, which will be discussed some more.

So it's sort of information, the system description and diagram. What are the boundaries of the CHP system, you know, what goes in and what goes out, can make a difference as to what's included within the scope of supply and what is not.

The annual forecasts by month; documentation of compliance with the specific requirements, which are the 20 megawatts, the .07 pounds per megawatt hour, et cetera. And then a performance verification and compliance plan.

Then this is the breakdown now of that previous slide as to what would be required from the host site. And it's, you know, actually pretty innocuous things of where it's located, what the business type is, what kind of existing generating and thermal systems are in use right now.

And then the historical or forecast electric and thermal loads by months for one year. And if there's variation, if it's not a baseload operation, then how that will vary by month, day of week, time of day, et cetera, by season. So what the anticipated fluctuations are in terms of the forecast.

Any questions about that type of information? Okay.

The system description. The prime mover. Conventional information, the manufacturer, the model, the nameplate, the ancillary equipment, because those loads get subtracted in getting to the 20 megawatt number.

An electrical one-line diagram. And then a system diagram. And I give a reference to a report that's on a website. These are protocols that were developed by members of ASERTTI, the Association of State Energy Research and Technology Transfer Institutions.

And they're used most extensively now by NYSERDSA, the New York State Energy Research and Development Administration, on their programs where they fund demonstrations. They've got approximately 100 sites under operation. And I'm getting an estimate of how much this would cost to do this monitoring. And it's on the order of $15- to $25,000 for three years of monitoring. So there are some cost implications in terms of doing the monitoring if that were required.

And then the annual, the forecast. This is breaking down the useful energy output really

in more detail. So it's that calculation that gets you the useful energy out, divided by the fuel in. And it's done monthly. This is what was done by the SGIP program.

And I'm choosing the month because that doesn't, to my knowledge there was not a great concern about having to report on that time basis, as opposed to breaking it down more extensively.

And then the documentation of compliance, development of a template that would actually go through these calculations step by step. If you're curious what these types of calculations might look like, they're in the SGIP program. Or with respect to greenhouse gas compliance, there are guidelines -- I forget exactly what they're called, the clarification of the mandatory reporting requirements under AB-32 by the Air Resources Board.

Performance verification and compliance plan. One of the historical things that I brought with me from PIER is requiring on any project that had a demonstration aspect associated with, is some type of test plan. This is the same type of thing, except it's a verification and compliance plan.

It's just really -- this could potentially be a couple pages long if you're wondering what the requirement is on this. That basically just says that this is the expectation of, you know, how we're going to determine how the CHP system owner is going to determine whether or not the system meets these requirements.

And one of the things the legislation specifically says is a reference to warranties and service agreements that would insure that the system does meet these requirements over time. You know, the manufacturer of the equipment guarantees that they will do this.

So it could be really just the submittal of the warranties that come with the prime mover as to meeting these requirements.

Going much faster. And then compliance, corrections for compliance. And one of the things is if there is a compliance element involved in this, who does it. Who determines whether you do it or not.

One alternative is certainly self-certification, where perhaps in terms of the tariff where on an annual basis the applicant would say that, yes, they continue to comply with

the requirements. And submit that to the electric utility.

The Air Resources Board, which already has greenhouse gas reporting requirements. The utility, as the buyer of the electricity. Under the SGIP the utilities, as buyers, or as -- well, not buyers of electricity, but as administrators of a buydown program, have looked at how well systems have performed.

The Energy Commission could potentially do that. There's a group at the Energy Commission that routinely does audits, and could potentially even accommodate Ray Williams' comment about following the mini loading order in terms of efficiency. Or it could be an independent third-party consultant.

And I really don't have a strong feeling on any of these one way or the other. I would probably say I'm almost pretty much tied between the Energy Commission doing it, or it being a self-certification system.

And then what happens if you don't comply. Well, if you're small, this relates to Michael's point about do you have different rules for different sizes.

If you're less than 1 megawatt, you've got three years to comply. If you're larger than a megawatt you've got a year to comply. And if you fail, then you get a reduction in the amount of payments you get, depending on exactly the same as the percentage with which you fail to achieve one of the requirements.

And if you fail to achieve multiple requirements like let's say the NOx and the efficiency, then you get dinged on your payment for subsequent ways.

So, this is something that actually came out of a project I did with PG&E's research and development program, called PV USA. Where there was a premium if you delivered more energy from a photovoltaic system. And if you fell below it, you got less. So it was a percentage as pay for performance.

So that, I believe, is the last of my proposals. And the last ones went very quickly. So, there's --

PRESIDING MEMBER BYRON: Good. Dr. Soinski, there's a lot of material in here, and I hope --

DR. SOINSKI: Yes.

PRESIDING MEMBER BYRON: -- that there will be some discussion around it. The one thing that I thought you might be missing from required information are safety issues. Rule 21 compliance on interconnection, for instance. Had you thought about that?

DR. SOINSKI: Well, it's covered in the fact that there has to be an interconnection agreement.

PRESIDING MEMBER BYRON: So that would be taken up there.

DR. SOINSKI: So that would be automatically included.

PRESIDING MEMBER BYRON: Likewise, criteria pollutants, ARB would be responsible --

DR. SOINSKI: Or a local air district would be. So, right, I haven't addressed CO or any others, right, because if you don't have -- well, if you don't have a building permit and if you don't have an air quality operating permit, I mean you can't operate. So you can't sell.

So I'm assuming that those are automatically included effectively by -- you know, in order to remain in operation. And so that they don't have to be here. Because I didn't want to

put anything here that was not really necessary, to my mind.

PRESIDING MEMBER BYRON: Okay.

DR. SOINSKI: So that's my perspective on that, on treating that --

PRESIDING MEMBER BYRON: Very good. Unless there's any other clarifying questions, I think we'll go ahead and take up the specifics of the proposal later on in the discussion.

Seeing none, Dr. Soinski, --

(Laughter.)

MS. KELLY: Okay, next, we're going to hear from ARB. We're going to have two presentations then. And actually I'm passing around some of those presentations. If you didn't get one, there's some more at the back. And there'll be two people presenting.

The first person will be Gary Collord; and he'll be talking about AB-32. And then following him we're going to have Doug Thompson, who is going to talk about the reporting requirements for greenhouse gas in California.

So, Gary. Let's see now, I think I've got this down.

PRESIDING MEMBER BYRON: Mr. Collord,

welcome back to the Energy Commission. We miss you here. But I hope the ARB is benefitting from your skills and expertise.

MR. COLLORD: Thank you, Commissioner Byron, and everyone. Good afternoon. I'm Gary Collord with the energy section at the Air Resources Board.

And I'm going to be fairly brief today, since it's getting late. And I'm going to present a brief overview of the AB-32 scoping plan measure dealing with combined heat and power systems.

And I probably should note that my presentation will address issues beyond the scope of AB-1613.

So this first slide shows the scoping plan, CHP goal, which calls for achieving 6.7 million metric tons of annual greenhouse gas reductions by the year 2020. And this reduction was based on an assumption for increasing or expanding the state's existing CHP capacity by an additional 4000 megawatts by the year 2020. And so it's a fairly aggressive goal, and we have a short timeline in which to realize it.

This slide shows the percentage of greenhouse gas reductions for the proposed CHP

measure relative to some of the other electricity sector reduction measures.

The California Solar Initiative programs comprise about 5 percent of the total. CHP systems about 15 percent. The proposed energy efficiency standards 34 percent. And the balance will be met by the 33 percent RPS, making up 46 percent.

PRESIDING MEMBER BYRON: Thank you that's really helpful to see that graphic. And I want to make sure I'm interpreting that correctly. I mean we expect three times the GHG reduction from this CHP sector than we will get from the million solar roof initiative?

MR. COLLORD: That's correct.

PRESIDING MEMBER BYRON: And we will expect to see fully about one-third as much emissions coming from this sector as we do from the entire state's RPS standard. I assume that's the 33 percent RPS.

MR. COLLORD: That's correct, yes.

PRESIDING MEMBER BYRON: Thank you.

MR. COLLORD: In developing the CHP measure, ARB worked closely with the staff of the Public Utilities Commission and the Energy

Commission, and we continue to work closely with them.

ARB also hosted a couple of working groups. And we received a great deal of feedback from the participants in those working groups.

As I'm sure most of you know the measure in the scoping plan relies heavily on the PUC and the Energy Commission as the lead agencies for implementing the scoping plan measure.

And it relies largely on implementation of the 2007 IEPR recommendations for removing barriers to CHP and providing additional incentives or mandatory programs to insure that the goal is met.

And we found that the feedback we received from the working groups we hosted were very similar to the recommendations from the 2007 IEPR. And so we're hoping that the actions the PUC and Energy Commission plan to take will be reflected in the 2009 IEPR with respect to achieving this CHP goal.

And, finally, the Air Resources Board is available to provide any necessary support to the Energy Commission or PUC in order to achieve their reductions.

Some of the other issues that have come to light since we drafted the measure include the participation and role of the publicly owned utilities in helping to achieve the CHP goal. And so we need to be thinking about, you know, how do we insure their participation. What their role should be, since there's quite a varied range of sizes and capacities of publicly owned utilities. You know, should they all have a role, or should we just try to encourage participation by the larger entities. So that's an issue that needs further discussion.

It's also come to light that there is quite an extensive amount of existing CHP capacity that perhaps is at risk of being lost due to changing contract provisions under PURPA. And so that's also another issue that we need to be thinking about and try to address.

And then finally, this sort of goes back to the issue we've heard for bottoming cycles and making use of waste fuels or waste streams. There's an issue of considering how do we encourage and facilitate CHP systems that can realize greenhouse gas reductions, even if they don't meet some of the proposed standards, such as

the 60 percent efficiency threshold under AB-1613.

Maybe that's not the appropriate proceeding in which to deal with it, but it's something that needs to be addressed somewhere along the line to insure that we can attain greenhouse gas reductions wherever possible.

And finally, just with quick reference to the proposed cap-and-trade program, ARB really hasn't decided exactly yet how it will treat CHP under that system.

But the joint recommendation from the Public Utilities Commission and the Energy Commission to ARB was to kind of include the electricity generation from CHP in the cap-and-trade program. And to use the same size threshold applied to other electricity sector deliverers for electricity generated onsite or exported to the grid.

And I understand that proposed threshold is about 25,000 metric tons currently, which I think breaks down to about 10 megawatts in capacity.

And then finally the joint decision recommends that emissions from thermal output --

PRESIDING MEMBER BYRON: Excuse me, Mr.

Collord, --

MR. COLLORD: Yes.

PRESIDING MEMBER BYRON: -- just a -- I haven't done this math, either, on the threshold. But that would be 25,000 tons?

MR. COLLORD: Metric tons, right.

PRESIDING MEMBER BYRON: That's per year, correct?

MR. COLLORD: Correct. Yeah.

PRESIDING MEMBER BYRON: All right. Yeah, I will do that math, myself. I think it's a much smaller threshold than 10 megawatts, but I could be wrong. Please continue.

MR. COLLORD: Yeah, I'm not exactly certain about that, either.

And then finally, emissions from thermal output, it was recommended that they be treated under the commercial or industrial sectors for the cap-and-trade program, if at all.

And so that's the extent of my presentation unless there are any questions. I'll try to answer them.

PRESIDING MEMBER BYRON: Good. I'm glad you're here. We probably should have started with your presentation, because I think really the

theme of it is the ARB is interested in finding greenhouse gas reduction wherever you can.

And that really should be the theme of our workshop here. That's what we're trying to accomplish, as well -- sector could be responsible for as much as 15 percent. When I say the sector, the combined heat and power subsector of the electric power sector could be responsible for as much as 15 percent of that reduction. That's what you're looking for.

MR. COLLORD: Right. And it very well may be that there is some flexibility under AB-1613 where some of these other issues could be addressed, as well, perhaps for, you know, a lower incentive as the one that's being proposed.

PRESIDING MEMBER BYRON: Okay. Thank you. I think we have a question for you. Please come forward and identify yourself, please.

MR. SZAGNER: Hello, I'm Joseph Szagner, Executive Director of Sustainability and Energy Management at Stanford University.

A clarifying question on your, I think it's your second slide. Can you let us know, in reducing -- the goal to reduce 6.7 million tons per year, with 4000 megawatts of CHP generation,

might you have a figure to tell us what that equates to in terms of plant efficiency or heat rate or pounds per megawatt hour?

If you, say, hold the thermal part of CHP at say 85 percent generation, then what would the CHP have to be in terms of efficiency or heat rate or pounds of carbon per megawatt hour to achieve this? Do you have those figures, by chance?

MR. COLLORD: I don't think I could tell you those numbers offhand. And I'm not sure how helpful this will be to you, but, you know, the reduction goal was based on looking at the efficiencies of simple cycle gas turbines and combined cycle gas turbines in calculating the potential reductions; and translating that into a capacity.

MR. SZAGNER: Okay, thanks.

PRESIDING MEMBER BYRON: Did you have a point around that, Mr. Szagner? Do you think it's perhaps not achievable?

MR. SZAGNER: No. Without knowing the figure I just don't know how to equate, because it would greatly go to the influence of what the threshold, the 60 percent or whatever standard it

might be, for CHP under these proceedings. It might inform that.

If to achieve that 6.7 million tons we find out we only need combined heat and power say of 52 percent efficiency, if you have 85 percent as your thermal side, that tells you one thing, if you need 74 percent efficiency.

So it just helps us zero in on what the combined efficiency of CHP might have to be to achieve these greenhouse gas reductions by say fixing one of the variables, the thermal component say, at 85 percent, since that's fairly -- a lot easier than fixing the generation side, since there's so much other kinds of generation.

PRESIDING MEMBER BYRON: That's a good question. I'm certainly going to ask our staff to work with ARB and see if we can look at those kinds of analysis. I mean we're certainly interested in not just the thresholds, but, indeed, what kind of penetration we need, and how achievable these goals are.

MR. SZAGNER: Okay, great. Thanks.

PRESIDING MEMBER BYRON: Thank you. Thanks for being here.

So, Ms. Burgdorf, do you have a

question?

MS. BURGDORF: I have a comment.

PRESIDING MEMBER BYRON: Please come forward.

MS. BURGDORF: Good morning; I guess it's good afternoon now. Commissioner Byron, --

PRESIDING MEMBER BYRON: You'll need to identify yourself, please.

MS. BURGDORF: Marci Burgdorf, Southern California Edison. I just wanted to comment on the last gentleman. We've actually tried to back into the calculation of 4000 megawatts, and the 6.7 million metric tons.

And from what we've looked at it's anywhere between you're looking at efficiencies between 70 to 78 percent in order to achieve that reduction.

So in terms of talking about efficiencies moving forward, and around this AB-1613 development, we're going to need something a lot more than 60 percent to be able to achieve the 6.7 million metric tons.

Thank you.

PRESIDING MEMBER BYRON: Thank you. So, Dr. Soinski, I'm counting on you to do a similar

analysis.

DR. SOINSKI: I'll just ask him to send me the data.

(Laughter.)

PRESIDING MEMBER BYRON: Please go ahead.

MS. KAHL: Hi, I'm Evelyn Kahl here for the Energy Producers and Users Coalition. And I guess my question to you, Gary, is ARB focused as much on the 4000 megawatts, or is it really focused on 6.7 million metric tons?

MR. COLLORD: It's really the 6.7 million metric tons. And I guess it depends on, you know, how efficient the systems are that ultimately are developed. You know, it may require less than 4000 megawatts, it may require more.

It was just the 4000 was kind of a benchmark that we used for setting the goal.

PRESIDING MEMBER BYRON: Good. I think we have a second presentation?

MS. KELLY: Yes. Yes.

PRESIDING MEMBER BYRON: Thank you, Mr. Collord.

MS. KELLY: Thanks, Gary. The second

presentation is by Doug Thompson; he's from ARB. And he's going to talk to us about -- sorry, I can't do --

(Pause.)

MS. KELLY: He's going to talk to us about the reporting requirements. These are reporting requirements that Art has included in his guidelines. And we thought it was better, you know, Art could try to answer questions on these, or are there any problems with these guidelines.

And so Doug agreed to come and present a short presentation on these guidelines, the reporting requirements. And then if you have any questions you can ask Doug directly.

(Pause.)

MR. THOMPSON: Okay, well, thank you, Commissioner Byron and Linda, staff, for having us over to talk about the mandatory reporting rule. I'm not going to spend a lot of time, but your staff did ask us to come and basically give you some of the background, the basic requirements, to cover in brief the costs. And mention third-party verification.

So, we're going to do that. We've got a couple slides, also, on cogeneration in

particular.

So, the regulation was approved actually 16 months ago now by our Board, December 2007. And it's now effective. The first reports under the regulation -- here we go -- the first reports under the regulation are due June 9th -- pardon me, June 1st of 2009.

And the initial reports can rely on best available data for 2008. There are specified requirements that cover calculation in the regulation. And those need to be met with reports beginning next year. And hopefully, as much as possible, this year.

The reporting will be accomplished through use of an online reporting tool that ARB has available via the website there.

The regulation covers a number of sectors, oil refiners and hydrogen plants, cement plants. AB-32 was explicit in covering the largest sectors first. So we gave a lot of consideration to what the major sources were in California. That would include stationary combustion sources of any type that are above 25,000 metric tons of CO2.

We went quite a bit smaller for

electricity generation and cogeneration facilities. We go down to 1 megawatt and 2500 metric tons of CO2. And the reasoning for that is that AB-32 was pretty explicit in addressing all of the emissions from electricity in California, both generated within the state and imported. So by going down to that threshold we were able, essentially we capture about 99 percent of the emissions from the power sector.

We also brought in electricity of retail providers and marketers. They primarily report on their imports, their purchases and sales. And up to 800 reports will be expected over all. May be somewhat less than that. We're finding a lot of the facilities actually incorporate within them some of the additional facilities, including cogeneration.

The regulation requires Kyoto gases to be reported, as specified, by sector. And it specifies quantification methods. Most of those methods were adapted, at least initially, from the California Climate Action Registry protocols. There are exceptions to that, particularly in the oil and gas sector.

Up to 3 percent of emissions may be

estimated using simplified de minimis methods. And that means that you still need to report those emissions, but you can do that with simplified methods of your choosing.

We also require all stationary combustion emissions to be reported. There are process and fugitive emissions reported where specified. And also in most sector, indirect energy use is reported. Mobile emissions are optional.

The regulation requires verification of emissions reports by third-party verifiers beginning in 2010. Verification is optional this year.

ARB is undertaking a program to train and accredit verifiers and verification bodies. And that will begin likely within a couple of months. Probably in June.

Both private firms, including those who have already worked in this area under the California Climate Action Registry and the supervision of CEC. And air districts may receive accreditation.

And reporters are able to choose their verification bodies, but that is subject to

conflict of interest review by ARB.

And Art asked that we say something about costs. We did an analysis of costs at the time the regulation was proposed. The costs, of course, vary quite a bit because the types of facilities covered vary quite a bit.

But in general you're probably going to see costs for reporting and verification that start around $5000; maybe as low as $3000, and up to $25,000. But it can get larger for refineries; some of the large electric utilities may have larger costs. But quite a range of costs, probably averaging about $20,000.

We think the third-party verification, though it does add costs, also adds value to the program, particularly with the cap-and-trade, that's going to be very important for the credibility of those reports.

And we also think the reporting tool will enable costs to be reduced in the coming years, particularly as firms set up their facilities and are able to return and only enter emissions data in the following years.

So cogeneration facilities. As I mentioned, are reporting when they reach that 1

megawatt threshold, and 2500 metric tons of CO2 from electricity generating activities.

That requires a distribution of CO2 from fossil fuels. The regulation addresses CO2 from fossil fuels, in particular, by requiring them to be distributed. And it looks to methodologies initially proposed by CCAR for topping cycle, and expanded by ARB at the bottoming cycle method known as the efficiency method.

And so both of those do assign some emissions to electricity. It is a pretty conservative assignment in the case of bottoming cycle, but it is there. So the question comes up, why distribute emissions. And that may not be necessary if we had a source-based system for electricity. But because California went down the path, at least initially, of a load based approach, we thought it was important to carry out the example -- carry forward the example that CCAR had set with the distribution of emissions.

PRESIDING MEMBER BYRON: Excuse me, Mr. Thompson.

MR. THOMPSON: Yes.

PRESIDING MEMBER BYRON: I may have missed it, what does CCAR stand for?

MR. THOMPSON: That's the California Climate Action Registry.

PRESIDING MEMBER BYRON: Of course. Thank you.

MR. THOMPSON: So, both PUC and CEC were on a pretty firm path at the time the regulation was under development for a load based point of regulation for the electricity sector. And there was a strong desire to know just what emissions were due to being electricity demand. So, we attempted to provide that.

We also didn't want to presuppose the outcome of policy discussions, those that would take place as the scoping plan was developed. PUC and CEC proceedings such as this, the Western Climate Initiative, and finally, the cap-and-trade regulation, which is now under development, and would be adopted over the course of the next year.

So the methodologies and the regulations stick to pretty much a basic engineering approach. We thought it would discourage initial gaming and meet our inventory needs, serve a load based system, and be consistent with the CCAR example.

We did that with the expectation, however, that once policies were further

developed, those methodologies could be revisited. And we expected that would occur certainly in the area of waste heat usage consistent with the scoping plan measure. And these proceedings, waste heat usage has emerged as one of the key strategies that may cause us to rethink some of those methodologies.

And so the expectation is in the course of developing the cap-and-trade rule over the course of the next year and a half, that those methodologies can be revisited, altered or augmented as needed. Because the expectation would be we have multiple goals to meet, and we will go beyond the initial goals.

So next steps include completing the first round of emissions reporting by June 1. Data sharing and analysis, we're certainly quite willing and expect to be sharing data with our sister agencies. There will also be public access to the emissions data through the reporting tool website.

And we'll see what kinds of analytical needs we have. And part of the challenge for ARB is to anticipate all possible analytical needs, and that may mean we need to retain certain

methodologies or requirements that may not initially thought to be needed.

PRESIDING MEMBER BYRON: Did we lose your microphone there? Do you still have your green light on?

MR. THOMPSON: Still on.

PRESIDING MEMBER BYRON: Let's just take a second here. I lost mine, as well, I think.

(Pause.)

MR. THOMPSON: Well, I'm almost done.

MS. KELLY: Okay.

PRESIDING MEMBER BYRON: Is there a way we can let people on the phone know we may have lost our audio here?

MS. KELLY: (inaudible).

PRESIDING MEMBER BYRON: But in terms of the audience here, if you'll just speak more loudly, and I'm sure the reporter will pick it up, as well. That's what the second microphone is for. You can proceed.

MS. KELLY: They're all dead. As soon as we take our break for lunch we'll start crawling under the tables and get everything right. Go ahead, Doug.

MR. THOMPSON: Fine. So, the additional

steps over the course of the next year include finalizing the reduction strategies in the scoping plan, including the cap-and-trade regulation. And considering whether what types of changes are needed in the reporting regulation.

We also intend to augment the reporting requirements as needed in the future, either to meet the needs of other state legislation such as this, or also additional sectors that may come in, particularly in response to the Western Climate Initiative. And the likelihood that we'll move eventually toward a regional trading program and a federal trading program.

This is just contact information for reaching me, Richard Bode is my boss at the Air Resources Board, as the Chief, emission inventory branch. Renee Lawver is our staff lead on cogeneration. And Renee is here. Also our website is there for your -- if you haven't seen that already.

Thanks very much.

PRESIDING MEMBER BYRON: Thank you, Mr. Thompson. You know, I have to apologize, ask for your forgiveness, because I haven't tracked, as closely as perhaps I'd like, all the activities

going on at the ARB, particularly with regard to reporting.

And I suspect that you're putting up this contact information to solicit input with regard to reporting.

But isn't the key issue really for combined heat and power what sector are the emissions going to be reported in? And maybe you addressed this and I missed it, but we've characterized it in our joint recommendation by the PUC and the Energy Commission, to the ARB on the electric sector, that it's an accounting issue first.

Does it go in the electric sector? Does it go in the industrial sector? And then, of course, the administrative burden that's placed on these smaller project is also of some concern.

But if you will, going back to that first issue, is that settled at the ARB yet, as to what sector this reports into?

MR. THOMPSON: It's certainly not settled in terms of the additional strategies adopted through the scoping plan and the need to perhaps augment the reporting requirements.

We had to settle it for purposes of an

initial regulation. And we settled it on the basis of using the efficiency methods that we developed for bottoming cycle, and the CCAR method for topping cycle.

We're quite aware of the understanding that perhaps in the case of bottoming cycle there should be no assignment of emissions to the electricity side. And we've heard that perspective. We understand that perspective. And I think we'll probably continue to listen to that perspective.

I would point out that our collection of distribution of emissions and an accounting of some emissions toward electricity doesn't necessarily presuppose what policy choice you make or ARB makes in the course of the cap-and-trade regulation, on where to assign those emissions.

That decision on where to assign the responsibility for those emissions is separate from the reporting regulation.

PRESIDING MEMBER BYRON: Thank you. Are there any additional questions for Mr. Thompson? Please, Ms. Vaughan, if you could just -- I think you need to come forward, it's helpful for the reporter so that they can capture it.

MS. VAUGHAN: Okay.

PRESIDING MEMBER BYRON: Unfortunately the folks on the phone --

MS. VAUGHAN: I'll just pretend that it's on?

PRESIDING MEMBER BYRON: Well, the second microphone is actually for the court reporter, okay.

MS. VAUGHAN: Okay.

PRESIDING MEMBER BYRON: So what we're losing here, unfortunately, is our telephone audience.

MS. VAUGHAN: Okay. Thanks.

It's Beth Vaughan with the California Cogeneration Council. Just a clarifying question, and I'm sorry, maybe I should have asked Gary.

But I was looking at your two presentations and Gary had a slide up regarding the recommended CHP actions, the joint recommendations. And I know you were talking about mandatory reporting. But you also talk about next steps. And this issue of finalizing reduction strategies for the cap-and-trade.

Where should we be, I think it's your point of which sector is this all being dealt in.

We may not necessarily agree with the joint recommendations by the CEC and CPUC on how to deal with CHP.

And I was wondering where, in which process should we be participating or which forum should we be participating to talk about that further.

And I know there's a cap-and-trade discussions going on and various components, but sometimes the cogeneration group gets lost in all of that. And I'm just not sure, is it better to have one-on-ones with people? Or is there a public forum to be discussing these issues?

MR. THOMPSON: Well, there's a process that --

PRESIDING MEMBER BYRON: Mr. Thompson, if you will, the other microphone needs to pick you up, as well.

MR. THOMPSON: Thank you. So there is a process, as you know, to develop a cap-and-trade regulation. And they're in the process, part of that is sort of specifying particular issues that need to be addressed in separate workshops.

And I've kind of flagged this one, and I think others are beginning to flag this one. And

get our, the office of climate change realizes that cogeneration needs to be addressed in probably a separate forum.

So I would look for some kind of workshop and encourage you to urge that be scheduled sooner rather than later within the development of the electricity portion of the cap-and-trade program to address cogeneration, in particular.

We --

MS. VAUGHAN: That's helpful. It made me think of Keith's point earlier as to the limited resources. And it's really hard to monitor all of the different workshops that are going on at ARB, and wondering is your issue going to appear in one of those workshops or not.

So, I take your point.

MR. THOMPSON: Yeah, and I'm glad to talk with you further and help your message to get heard where it needs to be heard.

MS. VAUGHAN: Okay, great. Thank you.

PRESIDING MEMBER BYRON: Ms. Vaughan, I'm very sympathetic to this concern. We have a proceeding at the Public Utilities Commission on this issue. We have joint recommendations that

we're making with our two Commissions to the ARB for the electric sector GHG reduction; we have, obviously, guidelines we're developing here and other interests in combined heat and power.

There are other proceedings at the PUC. There are at least two sectors that you need to be concerned about at the ARB for reporting both the electrical and the industrial. I don't know how much more thinly we could spread the resources that are required to cover all this.

And so I'm very sympathetic to this. And it's part of why I think it's incumbent upon us and the Public Utilities Commission to not assume that just because we have a party, the parties are going to show up. I've mixed a metaphor there, I think.

(Laughter.)

PRESIDING MEMBER BYRON: It's very difficult for everybody that's participating in the GHG reduction process that's going forward in this state, from investor-owned utilities down to the POUs, down to -- oh, we're back -- down to smaller organizations such as yours.

I'm very concerned about this. And this is why, I think, the agencies and the commissions

have to reach out, to some extent, and solicit your input. But also, to some extent, represent the interests of the end-use customer here, and the efforts that this sector is trying to do.

Again, it's all centered, though, on reducing greenhouse gases now.

MS. VAUGHAN: Right. And I appreciate those comments and we are one -- just because we don't show up doesn't mean we don't care. But we have limited budget and limited ability to appear at all these different forums.

So that's why I was wondering what's the most effective way. Certainly written comments, in this instance, we'll follow up probably with written comments. But not make a presentation today.

Thank you.

PRESIDING MEMBER BYRON: Thanks for being here. Any other questions for Mr. Thompson? If not, I think Ms. Kelly has some good news.

MS. KELLY: Yes, thank you.

PRESIDING MEMBER BYRON: Mr. Thompson, thank you.

MS. KELLY: I'd like to thank everybody this morning for coming and speaking --

PRESIDING MEMBER BYRON: Ms. Kelly, you need to use the microphone.

MS. KELLY: Oh, I'm sorry.

(Laughter.)

MS. KELLY: I have a good outdoor voice. I want to thank everybody for coming today and giving these presentations this morning.

This morning is about sharing information. But this afternoon is about reacting to that information.

And what I'd like to do is in the afternoon I'm going to reconfigure the tables so that we have the availability for people to come up and sit at the tables.

I'm going to put a sign-up sheet, and if you'd like to come and sit up at the table because you feel you'll have multiple times that you want to answer questions or comment on questions, just put your name here. And we'll try to accommodate as many of you at the table as possible.

But even if you aren't at the table, you're still going to be free to come up to the podium and comment on the questions.

What we're looking for this afternoon, we've asked some questions, and now we want to

hear what you think about these questions.

We've talked this morning, but now we want to know what you think, and what you think are the problems or the issues are with regards to these questions.

Before we start we've been asked to have two presentations, Eric and Keith Davidson are going to give us a short presentation before. But other than that, unless there is anybody else who has a presentation they'd like to give before the questions -- we have a public comment period afterwards, but if there isn't anybody who wants to do it before, we'll just go ahead with the agenda as I just outlined it.

Will that work for everybody? Okay.

PRESIDING MEMBER BYRON: Good.

MS. KELLY: All right, here's the sheet. If you want to sit at the table, please just sign up and then I'll find a place for you at the table. And then anybody else, you can just come up to the podium and we'll discuss our questions in the afternoon.

If you could get back here within an hour, maybe five minutes earlier, so we can get started around 20 till 2:00 it's going to be, I'd

appreciate it.

I realize it's not a long time for lunch, but I tried to give you a little late in the morning so that you didn't have to get up in the dark to come here.

So we have to move quickly through the rest of the afternoon.

I appreciate your cooperation.

PRESIDING MEMBER BYRON: Mr. Davidson, a question?

MR. DAVIDSON: Yeah, just a question about the, is there a time that this is going to end, or will it just go until --

PRESIDING MEMBER BYRON: There is some flexibility. We will make sure that there's plenty of comment.

However, that's not a license for you and Mr. Wong to make exceptionally long presentations.

(Laughter.)

PRESIDING MEMBER BYRON: Let's be back here at 1:40. And if you're late, you don't get to hear those two gentlemen speak. Okay?

MS. KELLY: Okay, thank you very much, everybody. Thank you.

PRESIDING MEMBER BYRON: Thank you.

(Whereupon, at 12:40 p.m., the workshop was adjourned, to reconvene at 1:40 p.m., this same day.)

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AFTERNOON SESSION

1:41 p.m.

MS. KELLY: Welcome back, everybody. As you see, we've reconfigured the room to really encourage discussion.

And as we were breaking, Commissioner Byron, several people indicated that they felt that if they gave short presentations first, it would better inform the discussion than if they gave them in the public comments after.

So we're going to have four presentations. We're going to ask people to move through them as quickly as possible. And as I indicated with Art Soinski, if you can ask clarifying questions, those are important.

But then I think some of the issues, I've looked over some of the presentations, are covered in our questions, you know. The issue of efficiency, several of the issues that are covered in our questions, I think we can have face-to-face discussions about what each of you think and your opinions on what these should or shouldn't be.

So, is that all right with you, Commissioner Byron, if we have these presentations first?

PRESIDING MEMBER BYRON: Sounds great.

MS. KELLY: Okay.

PRESIDING MEMBER BYRON: And I like our more informal setting here, although I am feeling rather isolated over here.

(Laughter.)

MS. KELLY: Well, yes, somebody please, you know, move in next to Commissioner Byron. There are two seats there. Please feel free to join everybody at the table.

PRESIDING MEMBER BYRON: Two or three. Mr. Collord, if you'd like to join me up here I'd like to chat with you briefly while we're --

(Laughter.)

MS. KELLY: And then people from the audience, please, you know, just come up here to the podium and participate through the podium, as well.

Eric, would you like to start?

Eric Wong, as you all know, is from Cummins; and he's going to give a short presentation on CHP.

MR. WONG: I want to thank you for allowing me to do this. What I've done here is very quick and short. I'm addressing several of

the questions that are asked by the Commission.

Before going on I do want to add that I am the chair of the California Clean DG Coalition, which is made up of manufacturers of internal combustion engines, microturbines and small turbines, and as well as project developers and consultants.

Okay, so what I'll cover today, probably take me no more than ten minutes, is the issue of the 66, or the minimum threshold that's in the statute, AB-1613 at 60 percent.

And I'm going to refer to a recent report that was published last December. And I have the report number there, PM2008 224. And I do have a few copies, so if you -- it's easily downloadable. Commissioner Byron, if you would like a hard copy, I have one for you.

Next I want to talk about, in a little more detail than what Dr. Soinski presented on LHG versus high heating value. And finally, this issue of subrogated power and combined heat and power, which has also been investigated in other states, among them Massachusetts.

Okay. To the first point on the 66 percent efficiency, this Oak Ridge report was done

and completed and published in December last year. It was done by ICF Consulting.

And what they did was look at 3300 sites over 85 gigawatts CHP capacity. And it's defined as that. I won't go through that. That's pretty much a standard definition in terms of looking at its being onsite.

The database is meant to be comprehensive for systems above a megawatt; about 98 percent comprehensive. And the -- system is about 80 percent.

And what they had to do for the above 80 percent, they actually did some estimating. And I won't get into that.

PRESIDING MEMBER BYRON: You say 85,000 all domestic CHP?

MR. WONG: Yes, this is in the U.S. Yeah. Thank you for that question.

Okay, so the CHP fleet performance here, and the one that they came up with is the average CHP efficiency of 66.3 percent. Again, for that 85,000 gigawatts on a higher heating value basis. And a total CO2 savings of, as given, of 248 million metric tons. And then the further assumptions are here.

Now, I'm just presenting what's in the report, and these slides are based on a conversation with Bruce Hedman, who was the lead investigator for ICF Consulting firm. And if there's a need for the Commission to get into any of the details, he asks that the Oak Ridge National Lab be asked specific questions. Don't just ask, say, for the database, okay, which would be extremely difficult to deliver. Although they do maintain it.

This is an illustrative slide here. I'm moving to the second topic, which is lower heat value versus higher heating value. And I'm saying here that it must be designated by fuel type.

You know, all morning we were talking about natural gas. And different fuels have different heating values, and therefore different ratio. So that will affect the conversion factor. I want to make sure that the three agencies here are, I think you guys are aware of this, but I just wanted to make sure that we're all on the same page in discussing this issue.

Again, this, I will say, this is from Wickipedia, okay, so I just Googled higher heating value and it led me to this. I won't, you know,

vouch for the veracity of this because at Wickipedia you can always go back in and change things. So, again, that's why I say it's illustrative.

For natural gas. We talked about the conversion factors earlier. And I do want to point out the difference between heat content conversion factor versus the efficiency conversion factor. Both, again, for natural gas.

Okay, so it's a little bit maybe counter-intuitive, but you spend some time on it, lot simpler than the second law of thermodynamics.

And, again, the other point I made about the previous slide is that it will vary by your fuel type.

The last point I wanted to get to is that I'm going to advise that the Energy Commission look at what has been done in other states. I can't darken the lights here; I don't know how to do that.

But this has been looked at in Massachusetts by the Massachusetts Department of Environmental Resources, I think, DOER. And they looked at this specifically. They got comments from a lot of people and at PACE Energy Climate

Center.

And I will be the first to admit there were many comments filed, some didn't even address the issue. PACE was one of the few that did and got very specific on this point of a high efficiency boiler versus the, you know, separate prime mover.

And also addressed the point which is in the second -- third sentence. Evidence from several experts in this field, including project developers, et cetera, have demonstrated that the effect of these very high standards that we need to provide a very small incentive, or no incentive at all to CHP in Massachusetts.

So, while there's some things you can translate and adapt from state to state, and there are others that you can't, my point here is that other states have investigated this, and urge the Commission to look at those other states.

I actually, in the sake of time, I presume that the Energy Commission will post this slide presentation on the website --

MS. KELLY: Yes.

MR. WONG: -- and so I'll save that. And that will get me to my recommendations.

Again, for the Oak Ridge report, if you have specific questions, again you would ask Patty Garland, G-a-r-l-a-n-d, of Oak Ridge. She'd be the one to ask whatever you want. Again, don't make it a broad request.

HHV, made that statement before. The metrics, I do resonate or echo the comments earlier that we need to have metrics for both topping and bottoming cycles, distribute differentiated. But I really think it can be done mathematically for bottoming cycles.

And finally, the separate heat and power and combined heat and power investigation in Massachusetts, and maybe Connecticut. But, anyway, there are other states, at least two states. One of the states is Massachusetts that has looked into this matter.

Contact information. And that's all I have.

PRESIDING MEMBER BYRON: Mr. Wong, if I could, on the last, the SHP versus CHP. And I had not heard SHP as a term until just the last month or so, separate heat and power, correct?

MR. WONG: Separate heat and power.

PRESIDING MEMBER BYRON: So isn't this

really about the relative efficiency, I mean let me ask it this way. If you're going to compare to a national grid average of 30 to 33 percent kind of efficiency, yet earlier when we were talking with PG&E, we were talking about an efficiency that might compare to the next power plant that's built, the most efficient combined cycle plant, which might have a much higher efficiency than that.

Isn't that really what we're talking about when we're comparing CHP versus SHP are those efficiencies embedded versus the next new --

MR. WONG: That's one comparison. But this one here specifically, as I understand it, both in Massachusetts, as it has appeared as an issue in the CHP workshops at the Air Resources Board, is to look at the -- I think it's actually here -- you're looking at the 95 percent efficient boiler, some super-efficient boiler. And separately you look at a very efficient prime mover, be it an ICE, a microturbine generator, or a, you know, small gas turbine.

So, it's not really a comparison to the central station power plant in California. It is

looking at the separate thermal unit and a separate prime mover unit versus a combined heat and power system, and how do they match up.

PRESIDING MEMBER BYRON: Um-hum.

MR. WONG: Does that --

PRESIDING MEMBER BYRON: Yes, but so in the second line there, typically stated in the range of 30 to 33 percent. That's the grid average, correct?

MR. WONG: Yes.

PRESIDING MEMBER BYRON: Okay. And that's not a very high threshold.

MR. WONG: That would be my opinion, too.

PRESIDING MEMBER BYRON: Yeah, but a 45 percent combined cycle plant is a much more difficult threshold, much higher threshold, so SHP -- I guess what I'm ultimately asking, does SHP make sense?

MR. WONG: I would probably say no. But, again, I'd want to investigate. I mean just a case-by-case situation.

PRESIDING MEMBER BYRON: Okay.

MR. WONG: I mean in my experience when I was selling cogeneration, we always looked to

the best thermal, electric and thermal match. And CHP was often, you know, most efficient. Otherwise you couldn't sell that to the end user. Because you had to demonstrate savings and payback within X number of years.

PRESIDING MEMBER BYRON: All right, thank you.

MS. KELLY: Any other questions or clarifications? Okay.

Next, Keith Davidson has a short presentation.

(Pause.)

MR. DAVIDSON: Thanks, Linda. And thank you, Commissioner Byron. Art Soinski had asked me to share with the group other perspectives I may have on, you know, what an appropriate efficiency floor should be or could be for combined heat and power.

And I just thought it would be useful to kind of share what the state of Oregon is doing, and how they're approaching combined heat and power. And then follow it up with a few analyses on some various cogen technologies that I've done, just to give you an indication.

But the approach that Oregon uses, they

call it fuel chargeable power. So the mindset is that our cogen unit is displacing a boiler. So your primary purpose isn't necessarily general electricity; your purpose is to displace a boiler. And power is a byproduct. And the avoided boiler fuel, then, is subtracted from the fuel input to the combined heat and power system to come up with the amount of fuel that's really chargeable to power.

And this is one of their slides that they use to kind of explain it. I'm going to risk just kind of stepping away from here for a second.

But this is the fuel going into the unit; this is the heat recovery from the unit. Here's the avoided boiler losses that you would incur if you were to generate this amount of heat from a boiler. And what's left over is the amount of fuel that's chargeable to power.

So that's the approach that they use. And, you know, there's a certain amount of logic that goes along with their program.

They've got three different kinds of incentives that are available for combined heat and power. The Oregon Department of Energy is the first one. It's a 35 percent tax credit over five

years.

Or they give people a discounted cash payment. So even people that aren't taxpayers, nonprofit organizations, can get the benefit of that from the Oregon Department of Energy.

The Energy Trust of Oregon, as an incentive, it's linked to energy savings, and there'll be more about that on the next slide. And CHP is eligible to sell carbon offsets.

And unlike, you know, this is kind of a tangent, but I'll just say it now, that unlike the CEC/PUC-proposed or final decision to CARB where CHP users have to buy carbon offsets, they're saying you can sell your carbon offsets, and not have to buy carbon offsets.

So in this case it's an incentive. I worry that in California there's a disincentive being set up, or at least being talked about.

And the CHP incentives are consistent with energy efficiency and renewable energy incentives.

So everything they -- their whole energy incentive structure is all linked together in a consistent format.

Just a few tidbits on it. When they

talk about what the avoided resource is from combined heat and power, they -- I don't really know this model, but it's the Aurora model, which is a regional dispatch model that they use to calculate what the avoided resource efficiency is for baseload power from a combined heat and power system.

And by the way, most of this pertains to, I think most of this pertains to onsite generation, and not necessarily wholesale generation. But I could be wrong.

And just kind of an FYI, their avoided resource mix includes a percent coal.

They do take into account transmission and distribution losses. So in addition to that avoided resource number, there's T&D losses that get added to that. And if they're a transmission level customer it's 6 percent; primary, secondary, it's 10 percent.

But that is not necessarily the threshold for participating in the program. That kind of benchmarks what you're savings are. To participate in the program, and this is the same number for the office, Oregon Department of Energy, and the Energy Trust of Oregon. They have

a threshold, an efficiency threshold of power chargeable to power -- fuel chargeable to power of 6120 Btus a kilowatt hour.

And basically it's calculated on a 6800 Btu a kilowatt hour combined cycle plant. And they've bettered that by 10 percent. So that was their rationale for how you become eligible.

And then I think, as everybody here knows, there's all kinds of technologies that are available for people that are considering combined heat and power, depending on your size.

And so what I did here was to try just to illustrate what the fuel chargeable of power for various combined heat and power technologies are, against some central station.

And the assumption here, all these numbers were taken from the spec sheets. Here's a simple cycle gas turbine, 100 kilowatt engine, 2000 kilowatt engine, 65 kilowatt microturbine and a 1400 kilowatt fuel cell. These are all numbers from the spec sheet.

And if you look at this, aside from this bar here, that would be the heat rate of the system without any heat recovery. And if you subtract out the heat recovery, and then you

subtract out, in addition to that, the boiler losses you would incur, and for this I assumed an 80 percent efficient boiler, which I think is a little higher than the average mix in California, from what I understand.

And then you compare that against -- this is SB-1368, so this is the California procurement efficiency standard. You can see where that number is.

This is basically the unit that Oregon used to kind of set the benchmark. It's a 50 percent higher heating value efficient combined cycle system. And then there's some talk about some, you know, the new GE system, which I think there's a unit or two operating internationally, but not in the United States, that actually gets a lower heating value efficiency of 60 percent.

So, all of these heat rates, by the way, a higher heating value.

And then you can -- the same graph, just a different scale, can tell you really what their greenhouse gas emissions are. These are all natural gas systems. And in the interest of time I'm not going to go through that.

So then when I -- this one here was same

thing, 100 percent heat utilization, 85 percent efficient boiler. It basically made this part a little bit smaller, this piece a little bit smaller and moves it up on top of the line. It didn't change it a whole bunch really.

So, 100 percent heat utilization. To me it's -- to me I'm comfortable in saying that if you use all the heat, combined heat and power is a really good thing for California.

And now what this does is say, all right, what if we only use 80 percent of the heat. And the numbers here are what the overall efficiencies become. And I probably should have went through those in the last slide.

But you can see that they're all dropping down between low 60s and 70 percent. If you only use 80 percent of the heat and the bars start creeping up, and they start encroaching on this super combined cycle, which is really sort of the eligibility threshold as defined by Oregon. So this number equates to about the same as what Oregon has as their eligibility threshold.

And then, you know, same thing on the greenhouse gas emissions.

And then what I did, let's just say

they're all at 60 percent overall efficiency. And if you really get there you can see that I think all or them, or most of them, stay below the current, you know, metric for combined cycle. But probably very few of them equal the threshold that Oregon would have set out.

But, you know, to me it's close enough where I still say 60 percent's okay. But if you want to be more exact about it, I think maybe Oregon's approach is a little bit more methodical. You might want to, you know, there's probably other ways to look at getting to the same kind of an answer. And, again, it's the same thing, but greenhouse gas.

So here's the bottomline. Here's all the benefits for combined heat and power. And, you know, it is good value. It doesn't always make the most sense to do it first when there's energy efficiency options ahead of it. But there's still a lot of benefits.

And usually what happens, I mean I spent a bunch of years working for an energy service company before I started my own business, and we'd always look at energy efficiency options in tandem with combined heat and power.

And you'd usually wind up -- the efficiency wouldn't usually negate the combined heat and power. It would usually suggest that you look at a smaller system than you would have if you didn't look at the energy efficiency measures.

And, you know, so that kind of summarizes my remarks. And I would really encourage people to take a consistent approach with combined heat and power relative to renewables and relative to energy efficiency. Much like Oregon does, and several other states.

So that's it. Thank you very much.

PRESIDING MEMBER BYRON: So, Mr. Davidson, I take it you like what Oregon's done?

MR. DAVIDSON: I think it makes sense. I --

PRESIDING MEMBER BYRON: You need to be at a microphone. You need to be at a microphone.

MR. DAVIDSON: I'm sorry. Well, it's logical and it's defensible. And so -- and the, you know, the 60 percent seems to be a little bit arbitrary. And the Oregon approach does take into account differences in technologies that exist among combined heat and power systems.

But I think, also, 60 percent is close.

Sixty percent is easy. And I wouldn't object to the 60 percent. But Art asked for my thoughts and I just thought I'd share the Oregon example with you.

PRESIDING MEMBER BYRON: Very good, thank you. I think it's very helpful to have these kinds of out-of-state, out-of-body experiences. We need more of them here in California.

MR. SCHOENBECK: Excuse me, Commissioner. This is Don Schoenbeck and I'd just like to make one remark about the Oregon system.

Participants are allowed to buy offsets. So in the event they cannot achieve that efficiency goal, they can plant trees in Brazil, and they can make monetary contributions for other purposes to be able to achieve that target.

So, with that clarifying point.

PRESIDING MEMBER BYRON: Thank you.

MS. KELLY: The next presentation is going to be from SCE, Marci.

MS. BURGDORF: Thank you and good afternoon. This is Marci Burgdorf with Southern California Edison. And I wanted to give a background on Edison's cogeneration portfolio and

how we've been operating.

Edison has significant experience with cogeneration. We've been collecting data on cogen for more than 30 years. We have a substantially sized portfolio, 2200 megawatts of CHP. And we have a wide range of sizes and a wide range of efficiencies.

So we have very small systems in the 30, 40, 50, 60 kilowatt range, all the way up to about 400 megawatts. They serve a variety of facilities and plants, commercial buildings, schools. We have some wastewater treatment plants.

And the efficiency ranges quite a bit. We see efficiencies in the 30s, and we've seen efficiencies all the way up in the high 80s.

About half of the projects that we have sort of hit the 60 percent efficiency line. And about half of the projects operate either at or below that. There's a handful that operate right around the 60 percent. But for the most part, they are underneath that threshold.

We do have projects that have achieved very high efficiencies. We do have four projects that operate at or about, higher than 80 percent efficiency.

So the point is that, you know, there's a full range of efficiencies that we see. And that it is achievable. We have seen 60, 70, 80 percent ongoing.

In terms of system sizing, we have projects that serve their onsite load, or have just a small amount of excess to export to us. And then we also have a number of projects that export quite a bit of generation. And one-third of our projects, we purchase more than 50 percent of their generation combined.

We do have topping cycle and bottoming cycle CHP systems, with the majority of them being topping cycle. And the fuel sources for those are mostly natural gas. We do have some digester and coal-fired, as well.

PRESIDING MEMBER BYRON: Ms. Burgdorf, how --

MS. BURGDORF: Yes.

PRESIDING MEMBER BYRON: -- do you get the efficiency ratings for the various units?

MS. BURGDORF: The efficiency data is reported to us, self-reported from the generators, themselves, through their contract. So they report monthly fuel us data on an annual basis to

us. And that data is verified. We do auditing of the data, itself. And they report thermal output, fuel and generation.

MR. SCHOENBECK: Quick clarification, Marci.

PRESIDING MEMBER BYRON: Please use your microphone, Mr. Schoenbeck.

MR. SCHOENBECK: I'm sorry. Are all those higher heating value?

MS. BURGDORF: Yes, thank you. Good question.

MR. SCHOENBECK: Thank you.

MS. BURGDORF: They are higher heating value, yes.

So just to give you an idea in terms of our procurement, and the production and export efforts of CHP systems. What we did is divide out here into the larger type projects, the 50 megawatt and above range, and 50 megawatts and lower.

And a majority of the projects -- excuse me, the above -- smaller amount of the projects, you know, produce quite a bit more of the kilowatt hours to us. On average, in terms of the generation, about 77 percent of that is exported

to Edison, and we purchase that on an annual basis. So this graph just breaks down how it applies to the different sized projects.

PRESIDING MEMBER BYRON: Of course, the threshold we're talking about here is 20 megawatts, so --

MS. BURGDORF: Twenty megawatt, yeah.

PRESIDING MEMBER BYRON: -- it would be a subset of the darker blue here?

MS. BURGDORF: That's correct.

PRESIDING MEMBER BYRON: Okay.

MR. COLVIN: Marci, just --

MS. BURGDORF: Yes.

MR. COLVIN: -- try and talk into the mic. So, --

MS. KELLY: Your name?

MR. COLVIN: Sorry?

MS. KELLY: Your name?

MR. COLVIN: Oh, this is Michael from the CPUC.

Just looking at this graph, so if I'm reading it correctly, you have the ten projects over 50 megawatts, the 35 below 50 megawatts, so for a total of 45. Obviously, SCE -- you have more than 45 total projects. So where did the 45

number come from?

MS. BURGDORF: Yeah, that's the number of projects that reported data to us on an annual basis. This is based on 2006 data. And so it's the number of projects that have reported under the terms of their contract.

We do have projects that don't report data to us, but are under contract and operating.

MR. COLVIN: So of the 2000-plus megawatts in Edison's territory, but only these 45 projects are reporting data to you.

MS. BURGDORF: That's correct.

MR. COLVIN: And how much is that of your sample, do you have any sense of like --

MS. BURGDORF: In terms of megawatts?

MR. COLVIN: Yeah.

MR. GRADY: 99 percent.

MS. BURGDORF: 99 percent, thank you.

MR. COLVIN: Okay, there you go, okay, thank you.

MS. BURGDORF: In terms of payments to cogenerators in comparison to other technologies, specifically renewable technologies, this is data that's published in our financial and statistical report. And what it shows is the online dedicated

capacity deliveries and payments that have been made. This was in 07 for these.

And the one important point to stress here is that efficiency is not limited by size, it's not limited by operation, from what we've seen as part of our portfolio.

The top three projects here represent the highest efficiencies that we do have. You'll see there's a range of industries and a range of what they actually use the cogen for.

So we have refinery processes, we have heating for buildings, pools, spas, and surrounding buildings.

And our top efficiency projects export very little, if any at all, of their generation. They use almost all of it onsite, with the one in the middle having some occasional export.

The ones that are on the lower end, and again what we're trying to demonstrate here is that, you know, size is not limited by efficiency, and that it can be achieved. And has been achieved.

So some of the lower efficiency projects we have are noted here below. We have them ranging from manufacturing process, where they're

exporting a majority, if not all of their generation. And, again, a very similar type situation where you have a cogenerator that's heating their buildings and pools and kitchens, and they're still exporting quite a bit, if not all, of their output.

And then we do have two wastewater treatment plants listed here. And the one of them does serve almost all of the onsite load; and the other one is -- output.

PRESIDING MEMBER BYRON: Ms. Burgdorf, these, of course, represent a sampling of the 32 or so, if I have that number right --

MS. BURGDORF: Forty-five.

PRESIDING MEMBER BYRON: -- 45 that -- CHP units that are reporting. But would you know the average efficiency of those less than say 50 megawatts?

MS. BURGDORF: Do we know that, Will.

PRESIDING MEMBER BYRON: Or preferred less than 20 megawatts.

MS. BURGDORF: Less than 20 megawatts? The average efficiency. Off the top of my head I don't know.

PRESIDING MEMBER BYRON: Okay.

MS. BURGDORF: But we can certainly include that in our comments, --

PRESIDING MEMBER BYRON: Well, that would be the --

MS. BURGDORF: -- the breakdown.

PRESIDING MEMBER BYRON: -- that would be the one that I think would be of interest, since we're trying to talk about threshold for that.

MS. BURGDORF: Sure.

PRESIDING MEMBER BYRON: Thank you.

MR. DAVIDSON: This is Keith Davidson with the DE Solutions. But for people that are reporting to you have signed interconnection agreements with you? Or power sales agreements with you?

MS. BURGDORF: They have power sales agreements with us.

And that's all I have.

PRESIDING MEMBER BYRON: Thank you.

MS. KELLY: The next presenter is going to be from EPUC, and let's see --

MR. SCHOENBECK: Don Schoenbeck.

MS. KELLY: Okay, why don't you introduce yourself.

MR. SCHOENBECK: Thank you. Hi, I'm Don Schoenbeck. And this has actually ended up being a pretty good order because I'm going to talk in terms of efficiency, too. We've heard from Eric on a national basis; we've heard from Keith on a regional basis; and Marci's given some statistics about SCE's CHP facilities.

I'm going to go one level further down her way, if I can figure out how to use this. But before I say that, every efficiency value in my presentation will be higher heating value.

I absolutely believe what Art said in his presentation is absolutely right, the industry literature is a little bit sloppy in reporting efficiencies if it's HHV or LHV. So I made my best effort to make everything HHV.

And, again, this presentation will focus on efficiency. And we believe the correct value is 60 percent, that's what's in the legislation, and that's what we believe should be the target.

What we've done is an analysis where we've looked at actual EWG plants in the state of California based on 923 data for the year 2008. We've compared that with the presentation SCE did here about 23 months ago with regard to their QF

efficiency data for the year 2003.

Now, what Marci showed was 2006. 2003 versus 2006, in my mind, won't be that different as long as the thermal load's the same. She presented the argument that the size doesn't matter. You can get high efficiencies or low efficiencies for the same technology. It's actually because of the thermal load. So you can achieve high efficiencies with both small CHP and large CHP. But you need the same solid thermal load.

So what I've attempted to do here is by combining the CHP data with the EWG data, it gives you a representation of what's going on in the state of California today.

So what you see on the upper line that goes across the graph is that the average CHP fleet for Southern California Edison is around 60 percent. And the average EWG efficiency for the state of California is 36 percent. This includes every gas-fired plant that operated in the state for the 2008, as reported in that database.

From our review of it, there are only about four units, gas-fired units, that did not report in that database. And one of them is the

Oakland CTUs, for example. So they're relatively smaller low load factor units.

PRESIDING MEMBER BYRON: And EWG is the exempt wholesale generator?

MR. SCHOENBECK: Right. I'm using that term loosely --

PRESIDING MEMBER BYRON: All right.

MR. SCHOENBECK: -- to mean utility or a third-party owned natural gas-fired generation.

PRESIDING MEMBER BYRON: And I'm reminded, there's one other acronym we didn't spell out. And that's EPUC. Would you remind everyone --

MR. SCHOENBECK: Oh, Energy Producers and Users Coalition. I'm sorry.

That previous slide was actually based on the total efficiency basis. Did I skip two? Or I didn't skip enough. Let's see.

(Pause.)

MR. SCHOENBECK: Here we are. One thing I didn't explain about this slide, this is on a total efficiency basis, so it's taking into account for the CHP facilities, both the steam and the electrical production.

What I've done on the next slide, now,

is try to make it more of an apples-to-apples comparison by showing what would be the net electric for the CHP facilities. And I assumed an 80 percent efficiency for the thermal load.

What you'll see, of course, is a dramatic shift to the left of all the CHP facilities with the existing gas-fired utility and third-party-owned facilities going to the right.

I'm going to try to skip through here pretty quickly. I think one of the things that's noted too frequently in doing comparisons is people generally compare what's the existing CHP fleet to a brand new combined cycle turbine.

What I've done on this slide -- excuse me -- this slide shows in the middle all the combined cycle, the new combined cycle plants that have come online in the state of California where (inaudible) -- read the names. It's all the old, the 1950 to 1980 vintage oil- and gas-fired plants.

I managed to freeze this again, I think.

(Pause.)

MR. SCHOENBECK: So, now on this slide is the one I meant with respect to taking out the post-2000 combined cycle plants that have been

built in the state. There's approximately 10,000 combined cycle plants. So this is my apples-to-apples comparison on a net electric basis showing the existing Southern California Edison CHP plants with the pre-2000 gas-fired EWG plants.

So, again, when you use the same vintage of technology, you get a dramatic benefit in most cases of CHP over EWG.

Now, with respect to looking at new CHP, the EPA put out a report in December of 2008 showing different illustrative CHP facilities under five different technologies.

What I've pulled from that report is the typical installations they give for gas-- configurations they've given for gas turbines. What you have here is three solar turbine facilities, the Saturn 20, which is a 1 megawatt plant; the Terrace 60, which is 5 megawatts; the Mars, which is 10 megawatts. And then two General Electric plants, one that's 25 megawatts, you know, 2500, and the LM6000 is 40 megawatts. I realize the focus of this effort is 20 megawatts or less. But for completeness, I included it.

When you look at the total CHP efficiency, which is about the fourth line down,

you'll see, as Marci pointed out, you can have extremely efficient facilities that are 66 percent, all the way up to 72 percent, on a total basis. When you look at the net electric efficiency it's 48.7 percent all the way up to 66 percent.

So this is, in my view, very realistic and achievable electrical efficiencies for new CHP technology.

If you look at the most efficient combined cycle plant that ran in 2008 in the state of California that was the Metcalf Energy Center. And that was less than 50 percent.

So, once you get above Saturn 20, every net electrical efficiency is superior than the best combined cycle plant that's run in the state in the year 2008.

There's also a little note, if you can read below the Metcalf Energy Center line on the left side, that's this kind of almost mythical GE Frame H plant. Sometimes I've seen the 60 percent number used for this plant. And just want to be very specific that the 60 percent isn't LHV efficiency. Every manufacturer of facilities will always talk in terms of LHV because they want

their heat rates to be as low as possible. But on a HHV basis it's 54 percent. And there are, as far as I know, two plants operating in the world, there's one in Wales and one just started up in Japan this past January.

So, again, obviously our bottomline is if you compare the efficiency of a CHP plant with the same vintage of electrical generating plant coupled with an efficient 80 percent type boiler, we believe the CHP will win in most instances, giving significant efficiency savings and greenhouse gas reductions for the state of California.

So what we did was trying to show what's a possible future for the state. So what this is, is bringing some of the new CHP into the state that would be at the same efficiency levels as I showed on the previous slide, where the facilities we brought in ranged from 1 megawatt to 40 megawatts. And we put them in on the same percentage basis as the existing CHP program.

So effectively what we did is we equivalently doubled Edison's existing CHP fleet with new technology. And what you'll see is on the far right, the only place where some of the

new combined cycle plants come in and are better than a combined cycle plant, the latest and greatest combined cycle plant, is in the case of the 1 megawatt, which get beyond the 1 megawatts to the 5, to the 10, to the 25s and 40s, in all instances are the efficiencies of those plants superior to the state of the art EWG combined cycle plants that have been built in the state.

And that's the end of the presentation. This is just the same slide on a net electrical basis as compared to total efficiency basis.

Thank you.

MS. KELLY: Okay, thank you very much. So I think we've, from these slides, gotten some interesting opinions about question number one.

And now what I'd like to do is go ahead and go away from presentations. There's people that are sitting at the table, and people sitting in the audience.

And, Commissioner Byron, I think that what I'd like to do is go ahead and put the questions up on the board here, and just start with the first question.

People can raise their hands. I don't think we need to go around the table. If you have

nothing to say, that's fine. But why don't you just, you know, indicate to Commissioner Byron that you'd like to speak.

And, Commissioner Byron, can you handle around the table? And then once we're finished around the table, then anybody in the audience who would like to add comments on each of these questions can just come up to the podium. Will that work? Okay.

PRESIDING MEMBER BYRON: Sure. When you're referring to the questions you mean out of the meeting notice, correct?

MS. KELLY: Right.

PRESIDING MEMBER BYRON: Okay. Can you have them put up on the screen?

MS. KELLY: I am going to, yeah.

Question one, okay. The first question that staff would like to pose to everyone is something that's very important to Art. It's is a minimum 60 percent efficiency requirement on a higher heating value basis the appropriate minimum efficiency to achieve the objectives of the act for 20 megawatts or under?

Would a higher efficiency standard result in fewer CHP installations and perhaps

lower greenhouse gas emission reductions than a 60 percent standard? Why or why not?

PRESIDING MEMBER BYRON: Please, go right ahead. Identify yourself.

MS. KELLY: And remember to say your name. Thank you.

MR. SZAGNER: Sure. Joe Szagner with Stanford. Sixty percent is really a good start, but both in the last presentation we had it showed 66 to 71 percent achievable. And in the standards from Oregon I would think, you know, 65 to 70 percent is more realistic.

When I take the factors from Oregon out of that presentation, 6120 was the heat rate after the 5 percent reduction specified. That's equivalent to a 56 percent combined cycle gas turbine plant efficiency.

When you combine that with, say, an 85 percent boiler efficiency, which I believe is a little more standard today than 80, but it's not going to make a whole lot of difference anyway, then that's equivalent to about a 68 percent overall combined heat and power efficiency.

So, in other words, we could get 68 percent with a main grid power plant at those

lofty levels that Oregon set; and an 85 percent boiler.

So, for CHP to actually be better and contribute less greenhouse gases and use less natural gas, then I would think something more around 65 to 70 percent would be better.

And my next comment would be on how one calculates overall efficiency of a combined heat and power. On the staff proposal slide, Dr. Soinski's definition of useful energy, I think, could use a lot of clarification.

The combined heat and power plant that, say, has chilling, as well. To say that the heat's used usefully if you put it through very low efficiency absorption chillers and so forth, I think kind of decreases the real value of combined heat and power if you don't compare what you could do with electric chillers and combined cycle gas power plant or grid power and gas boilers.

So I would recommend that we clarify useful as something other than made available for use, and have more standards that within the plant boundaries, if it's used for cooling or some other major process load, that you combine the heating, the cooling and the power, if it's a plant like

that. And compare that to the alternative with a little more specifics.

PRESIDING MEMBER BYRON: Well, that's a good discussion starter, thank you very much. Ms. Barkovich.

DR. BARKOVICH: Thank you. I wanted to speak about this specifically in the context of bottoming cycle or waste heat recovery. Several of us mentioned this this morning, but just to put it in context.

One of the things that I think we need to look at here is the fact that at least in a waste heat recovery system, for example in a bottoming cycle application for a cement plant, a glass plant or other calcining technology, what you're talking about doing is starting with an existing industrial process.

Fuel goes into the industrial process, which operates at high temperature. Waste heat comes out. Part of that waste heat is reused to preheat, et cetera, so you're attempting to use the fuel as efficiently as possible.

But even once you finish that there's still waste heat. That waste heat is capable of producing electricity. And that's the

application, at least, that I'm talking about. So you can call it bottoming cycle, you can call it waste heat recovery.

It's not a matter of either producing waste -- of not using the waste heat for efficiency purposes -- before you have, you know, you are using it for efficiency purposes to reuse it, but you still have electrical output at the end.

And the problem I have with some of these definitions is that in this particular context if you look at an existing application, not a de novo inventing it for the first time facility, but one that's efficient. In essence the fuel that goes into making the product is the same regardless of whether you produce electricity or not.

And therefore, when you start trying to divide up the idea of useful energy in terms of the industrial process versus the electrical production, it doesn't work very well. Because in essence, you would be using the same fuel whether you produce electricity or not.

And I had a presentation from another purpose, I'm sorry I didn't bring it here today,

with pictures in it. But in essence what we're talking about here is the straight use of waste heat recovery.

And for that purpose I think really what we're talking about is the fact that you either get electricity or you vent the rest of the waste heat. So it's a net productivity improvement, a net reduction in greenhouse gas because the electricity that's produced from straight waste heat has no incremental CHP. It has no -- I'm sorry, emissions, no increment al GHG. I'm sorry, that's what I meant to say. Thank you. No incremental criteria pollutants because basically it's being produced with straight waste heat.

If you attempt to apportion the fuel input to the electricity production separately from the industrial process, I think it's a misrepresentation of what's going on.

So some of these measurements I think don't work so well in the case of bottoming cycle.

The other point I wanted to make is that in the context of the representations stated briefly earlier about matching the thermal and the electric loads, it's not really relevant in the context of bottoming cycle, because you have

what's essentially a thermal process that produces waste heat that's used to make electricity.

You're not optimizing. In the case of a topping cycle you're making tradeoffs between heat and steam production and electricity production. In the case of bottoming cycle you're not. It's just a matter of adding onto an existing industrial process and trying to get some extra electricity out of it without increasing the fuel input.

So I don't know if that was clear or not, but we briefly alluded to this earlier this morning. And I just wanted to clarify that, you know, there's just differences in the technology compared to the kind of tradeoffs between heat and process steam production and electricity production with topping cycle.

And we will attempt to, for the comments on the 27th, try to say something about bottoming cycle in the context of the legislation that you're operating under.

I have been told that there was certainly no anticipation of excluding bottoming cycle because of the language in the legislation. It may just be inexpertly worded.

The openly other point I wanted to make is that if you look at the PURPA requirements for cogeneration, the 42.5 percent requirement, you know, that's been referenced in Dr. Soinski's presentation, there is a separate section for bottoming cycle that basically says that you don't have to worry about the efficiency calculation for bottoming cycle because --

PRESIDING MEMBER BYRON: Doesn't apply.

DR. BARKOVICH: -- it doesn't apply because basically there is no fuel input that's relevant.

So, --

PRESIDING MEMBER BYRON: Is there any -- thank you, Ms. Barkovich.

DR. BARKOVICH: I don't have the exact reference, but I have it in my briefcase.

PRESIDING MEMBER BYRON: Is there any dispute amongst those at the table or in the audience about the fact that we would like to recover and take benefit of bottoming cycle energy? That there is essentially GHG reduction opportunity there at no additional expense.

MR. SZAGNER: This is Joe Szagner. I'd certainly agree --

PRESIDING MEMBER BYRON: Come on up from the audience. You can -- there's another microphone.

MR. SZAGNER: As long as you look holistically at existing versus new installation, if you have an existing installation and you're just capturing that heat, well, that's a great net benefit.

If somebody's designing a new system then you would want to make sure that that's a different case, that you designed it so as not to produce that excess waste heat for the purpose of power generation without meeting some standards.

PRESIDING MEMBER BYRON: Um-hum. Okay. So, go right ahead. Go to the podium, if you would, and just identify yourself. Be great to hear from you.

MR. GRADY: Oh, yeah, I'm Will Grady from Southern California Edison. I'm the guy that collects all this data.

And as far as the bottoming cycle is concerned, I think there is, if you example PURPA you'll find there is a requirement if you supplement your waste heat, and there is an obligation.

I would suggest that for this purpose of this legislation that we're trying to implement, I think the intent was not to have someone have a waste heat process and then fire a whole bunch of downstream natural gas or coal or something just so that they can make more steam to make more electricity.

I think the intent was that if you have ways to heat and you can make some electricity from it, you're matching the waste heat with the electricity you can make, and you're not adding extra fuel just for the sole purpose of making electricity.

PRESIDING MEMBER BYRON: Sure, I think we all agree.

DR. BARKOVICH: I'm sorry, I neglected to say that. I was referencing it without supplemental firing. Clearly if there's supplemental firing then there's supplemental fuel associated with the electricity, and everything that comes along with that.

MR. SZAGNER: This is Joe Szagner, again. And I'd also add along those same lines if there's a CHP that does have another renewable fuel such as landfill gas or something, they may

be few and far between, that the process allows for that, too. And affords it that same net greenhouse gas treatment, because those things would have otherwise gone to -- or biomass would have gone, anyway, to the atmosphere.

PRESIDING MEMBER BYRON: Good. This is a good discussion.

MR. DAVIDSON: This is Keith Davidson, DE Solutions. I'd just go back to your 60 percent overall -- comment -- right there? Okay.

Keith Davidson, DE Solutions. Going back to the 60 percent overall efficiency question. To me it's close enough. And I think what's fully going to drive efficiency in the future is going to be the economics.

And the economics are going to drive you to higher overall efficiencies. And I would suggest that we not spend the next six months on a tangent trying to figure out whether it should be 60 percent or 62 percent or 65 percent.

MR. WONG: Yeah, Eric Wong with Cummins, and also on behalf of the Clean DG Coalition.

I'm going to take a different tactic to answer number one. I took the statute, AB-1613 as declarative on this. I mean it's even in Art

Soinski's notes.

PRESIDING MEMBER BYRON: I did, too.

MR. WONG: And if there is a legal issue here, or a statutory interpretation issue then I would urge the CEC to write Assemblymember Blakeslee. But, from my understanding how this bill went through, it's a declarative statement and we should end this discussion right now.

PRESIDING MEMBER BYRON: Oh, no, we're not going to end the discussion.

(Laughter.)

MR. WONG: I mean let me just, in terms of the debate, I guess I'm joining with Keith in terms of why should we spend time trying to fine-shave 60, 61, 68, whatever it.

Thank you.

PRESIDING MEMBER BYRON: I agree, Mr. Wong. I agree. I read the statute the same way. But nevertheless, I think it's a meritorious discussion here, and Art brought it up.

Unless anyone has anything else to contribute to that one -- yes, sir. Grab the nearest mic or the podium, whichever is your preference. The podium's nice; you can have your own --

MR. WICHERT: I prefer a mic, but I don't see an open mic.

(Parties speaking simultaneously.)

PRESIDING MEMBER BYRON: Have a seat.

MR. WICHERT: Okay, great. Robert Wichert with the Fuel Cell Council.

I'm not going to continue the 60 percent debate, but I am going to ask about useful, and I'm going to remark that it could have been the intent that the energy actually be used.

So when you compute your efficiency you might look for used, not just useful. And that is a significant change, as you know.

DR. SOINSKI: This is Art Soinski. One of the things that somehow got out of my notes is, is there a difference between used, useful and utilized.

MR. WICHERT: I would say two are the same, and one is different.

DR. SOINSKI: Well, right. And it's really -- it has to do with defining the boundaries. And this is one of the things I've been struggling with. Is if you put all of your thermal recovery outside of the CHP system box, then you have two thermal flows.

You have what's a hot water or steam flowing out, and you have cold water condensate coming back.

What that doesn't tell you is what happened between those two points of metering. I mean you know the flows, you know the total Btus. But you don't really know anything about the efficiency of how that was used, and relates to the question of, you know, what percentage, Keith's point on the utilization.

And I'd like to have, you know, any specific suggestions as to how that should be phrased to reflect that. Because it requires a lot more description on the thermal side of the system than on the electrical side.

MR. WICHERT: If I can follow up? Is that okay?

DR. SOINSKI: Please, yes.

MR. WICHERT: I'm thinking more along the lines of thermal load factor. I'm not talking about the efficiency of heat recovery. I'm talking about when the thermal load exists on a day-by-day 8760 hours per year basis. When does that thermal load actually exist, and when is it actually used. And to me that's a big difference.

DR. SOINSKI: Okay. And that's measured, do you have the standard that defines that? Because you're talking somewhat like an equivalent electrical load factor, right? Which is almost like a capacity factor, right?

So you're talking almost like a thermal capacity factor?

MR. WICHERT: Well, you get to it in your slide where you talk about the thermal capacity should not be more than the maximum thermal load. I think -- I was trying to read from that slide --

DR. SOINSKI: That had to do with not being a de facto wholesale generator. Right. I mean, sizing to meet the thermal load.

MR. WICHERT: Okay, and it also says that it shouldn't be smaller than the minimum thermal load.

DR. SOINSKI: Right.

MR. WICHERT: So if you have no thermal load on the 4th of July, then that's your minimum. And if you have 1500 thousand Btus per hour on Christmas day, that's your maximum thermal load. So you have to be somewhere between zero and that maximum.

But as the year goes by, some loads are going to vary. Now some won't. I agree, some won't. But some will. And so I'm suggesting you might think about how much of that thermal is actually used based on the site thermal load versus how much is useful.

PRESIDING MEMBER BYRON: I'd also like us to think in terms of not just how to -- as regulators, here, but as end-use customers, right?

When I first read that minimum/maximum, I thought in terms of gee, if I had a plant where's my load growth, where's my opportunity to increase the size of my production levels, those kind of things.

I'd like to just caution us to think beyond how regulators might think about this. It's kind of an irony for me to say that, I suppose, but -- are you finished with your point, or do you have more that you --

MR. WICHERT: I just wanted to suggest that Art think about it, not in terms of the maximum amount that the plant can produce, but the maximum amount that the site can use.

PRESIDING MEMBER BYRON: Okay.

DR. SOINSKI: Well, that was my

intention. Maybe it didn't come through in the language.

MR. WICHERT: It didn't, to me.

DR. SOINSKI: Okay.

PRESIDING MEMBER BYRON: Keith.

MR. DAVIDSON: -- in the back here.

PRESIDING MEMBER BYRON: Come on up to the podium, please. Go ahead, Keith, if you have a comment that you want to make real quick.

MR. DAVIDSON: Well, I was just going to follow up on Bob's remark. It's Keith Davidson.

And that is that a lot of the data that you showed, Art, and that you showed, that showed the very very poor efficiency combining power systems, some of which were monitored.

A lot of those were people sizing a unit based on sort of an average thermal load without taking into account the diurnal fluctuations in thermal that really do take place. And the, you know, a lot of them have cooling in it, and they kind of missed the boat in the shoulder months. And wind up throwing a lot of the heat away.

PRESIDING MEMBER BYRON: Um-hum. We have another commenter. Would you identify yourself, please?

MS. CONLEY: Yes. My name's Lisa Conley; I'm with Solar Turbines. We make gas turbines from right in this range we're talking about, the 5 to 20 megawatts. So we make -- get involved in a lot of cogeneration systems.

But my concern is our definition on how we're going to evaluate efficiency, and are we going to get a little too detailed.

When you talk about useful energy I understand what you're talking about, your box and heat out and the feedwater, the condensation comes back, you subtract that out. And that's your useful thermal energy.

I'm hoping you're sticking to that. If you would go out to a thermal site and start taking the efficiencies of each of the pieces that use the steam and take those out of the equation, you're going to have a hard time meeting our efficiency requirement of 60 percent. Those systems are going to be a lot less.

Sixty percent higher heating value is what, 68, 67 percent. Lower heating value on an unfired gas turbine, 7 megawatts, 5 megawatts, that's about what it will do.

When you duct fire that's when you start

seeing these 89, 90 percent efficiency systems.

But I think what this -- what you guys are driving to is getting away from duct firing to produce the steam, and oversize the system on the electrical side, so you meet just your unfired steam case. And now you're selling electricity to the utility. That's what this is driving.

So we're getting away from the higher efficiency cogeneration systems, because we're getting rid of duct firing, because we're allowing the cogenerators to export power to assume -- I assume it's going to make money for them, or they wouldn't do it.

But I don't know what kind of money we're talking about. The SGIP, I don't know what kind of money that'll bring to the cogenerators. I don't know if it's the same incentive as before. And that really, it's all going to be economic driven, as, Keith, you were saying.

PRESIDING MEMBER BYRON: Ms. Conley, I don't think we predetermined what the customer's intentions are. If he's got excess electrons, clearly it makes the economics much more attractive if there's a place to sell them. Or --

MS. CONLEY: Well, he just would size it

less if, you know, he would -- duct fire --

PRESIDING MEMBER BYRON: But we're not predetermining what the customer's interests are. I mean I remember a project a number of years ago, a customer was putting onsite generation because they wanted to get rid of refrigerants. That was a corporate goal.

So I think to predetermine or say what we know what the customer's intentions are, a little difficult to do here.

MS. CONLEY: Okay. Yeah, and I'm only speaking for the typical industrial cogenerator. That's all I can speak for. That user.

PRESIDING MEMBER BYRON: Okay. We've got lots more questions. This is a good discussion. Any more -- I was hoping we'd hear from our utilities. Since I saw you over there collaborating and discussing, --

(Laughter.)

PRESIDING MEMBER BYRON: -- I'm assuming that you both agree that 60 percent is a good threshold number, correct?

MR. WILLIAMS: Well, I think the collaboration was more innocent than you may have expected.

(Laughter.)

MR. WILLIAMS: I'm not an expert on CHP, and so I was asking Marci to help me out interpreting some of these slides.

So I just have a couple of comments, been very illuminating for me. One is in terms of greenhouse gas reduction -- I have two comments on that.

One is from listening to Barbara talk it seems like there may be a different expectation on bottom cycling units in terms of greenhouse gas reductions. If you are in the situation where you otherwise would have just not used the waste heat. Compared to topping cycle.

And I was just going back to page 12 of the presentation that Keith put together, where it looks very roughly at a 60 percent overall efficiency, HHV. Like a push.

And so in terms of the expectations of GHG reductions, topping cycle versus bottoming cycle, I'm beginning to see that there could be a difference.

And then the second is just from a utility portfolio point of view. This is from a utility point of view, this is basically a

baseload product. Right.

So what are we adding as a utility on the baseload side, it's energy efficiency, it's renewables, it's probably some -- as they get to the end of the term, recontracting with cogen facilities.

It's really not a combined cycle because we're actually using that to shape and to help run the system. A combined cycle for PG&E, at least, is not going to run at 80 percent; it's going to be a shaping resource, not really a baseload resource.

So I know we're using it as a proxy for our system, it may not be actually the best proxy.

MS. BURGDORF: Marci Burgdorf, Southern California Edison. On the 60 percent efficiency, we view that as a starting place for us. The state should, you know, always be looking at how we can advance the technology and how we can advance the systems moving forward.

So, you know, having a target of a higher efficiency is something we should always be considering, 60, 65, 70 percent. You know, 60 percent right now, what we're seeing is that a combined cycle gas turbine, some of them are very

close to reaching that level. So keeping that in mind and taking that into consideration.

And if we're really trying to reduce GHG emissions and get reductions we've got to be looking beyond that at some point.

And my second point is on this made available for use for the steam. I think making sure that there's actually a legitimate need for the steam, and making sure that there's some useful output or use for the thermal output. And that that's being, maybe that's part of the monitoring, but making sure that there is actually a need for the steam, we're not creating a need for the steam just to have CHP. And that it's being used in a manner that is consistent moving forward.

PRESIDING MEMBER BYRON: We're never going to get off this topic, I can see. But, Ms. Burgdorf, wouldn't you agree though, 60 percent is a good starting point? I mean really the goal here is to try and reduce GHG, and it can't all be utility generation. The ARB's looking for a significant contribution from this sector.

So do you agree that 60 percent is a good starting point, so that we can fulfill the

requirements of 1613 here, AB-1613?

MS. BURGDORF: I think it's a starting point to, yes, address that AB-1613 legislation. Addressing the GHG moving forward under the CARB scoping plan, based on the calculation, I don't think the 60 percent will get us to those reductions.

PRESIDING MEMBER BYRON: It should be lower, then?

MS. BURGDORF: Ha, ha, ha.

PRESIDING MEMBER BYRON: I mean we're also --

MS. BURGDORF: Should be higher, it should be in the 70 percent range.

PRESIDING MEMBER BYRON: Yes, but then we may be limiting the number of projects that will come forward at that higher percentage, correct?

MS. BURGDORF: Right, but again, the goal is to reduce emissions, right? I mean, the goal is to be achieving --

PRESIDING MEMBER BYRON: It's number of projects -- it's megawatts time is going to provide the emissions reductions. If we set a goal that's too high and there's no projects, then

we haven't reduced GHG.

MS. BURGDORF: Well, again, it depends on the efficiency of the systems, themselves. I mean fuel use --

PRESIDING MEMBER BYRON: Don't you agree that the comparison --

MS. BURGDORF: -- fuel use is --

PRESIDING MEMBER BYRON: -- the analysis that Keith just showed us is a reasonable comparison of utility efficiency versus CHP?

MS. BURGDORF: Right, and his comparison was against Edison's existing fleet of cogenerators. If you're -- we're talking about a lot of variable systems.

PRESIDING MEMBER BYRON: No, I thought the comparison was against a number of new --

MR. DAVIDSON: He's getting us mixed up, talking -- Don --

PRESIDING MEMBER BYRON: Oh, I'm sorry. Yes, I am. Mr. Schoenbeck. Don't you agree that the comparison that he showed was against a number of new efficient combined cycle plants, and high efficiency CHP plants? That the comparison was apples-to-apples?

MR. SCHOENBECK: His last two slides had

that new vintages.

MR. GRADY: The first time we've seen it, we need to look at it closely.

MS. BURGDORF: Yeah, I'm not sure what I can deduct from his one slide up there. But, again, I just want to get back to the point of, you know, improving efficiency should always be what we're looking for.

If we're looking to forward and advance the technology, if we're looking to forward emissions reductions, efficiency is directly tied to that. That's what we should be looking at.

PRESIDING MEMBER BYRON: Okay.

MR. COLLORD: Let me ask the --

PRESIDING MEMBER BYRON: Hang on one second, Art --

MS. KELLY: Can I bring this --

PRESIDING MEMBER BYRON: -- Mr. Collord's been --

MS. KELLY: Do you want me to bring this slide up?

PRESIDING MEMBER BYRON: That's all right; we'll skip over it. I don't think we're going to get any resolution on that.

Mr. Collord has a question.

MR. COLLORD: Thank you. And I hate to complicate this further, but I'm wondering whether AB-1613 precludes having a lower efficiency standard for certain kinds of CHP systems that perhaps don't qualify for the proposed feed-in tariff, whatever that's going to be. But perhaps we have a two-tiered feed-in tariff for systems at a lower efficiency.

Especially to deal with, you know, bottoming cycle projects or projects that are making use of waste gas from the oilfields or some other source.

As I read it, I don't think there's anything that precludes having more than one efficiency standard or feed-in tariff for CHP.

MR. COLVIN: Just to follow up on that, I have a separate comment that I'd like to make later, but just to follow up on that, you're right, there's nothing stopping us from having multiple tariffs being designed. It sort of gets away from the elegance of having one feed-in tariff.

I apologize; for the court reporter, this is Michael Colvin from the CPUC.

I believe the efficiency level is a

floor, though. And I don't think -- I think it will be very very hard for us to reach below that level.

I think there might be ways where it makes sense for us to define things in a way that we can still maintain the equivalency of that efficiency level, but have it apply, for example, to the bottoming cycle case. Or to a waste gas recovery case. Or a couple of the other kind of cases that I think socially we want to make certain are there.

But I don't think we're going to be able to say, okay, here's one tariff for 60 percent, and here's one tariff for 50 percent. I don't anticipate that that's the direction that either of the Commissions are headed in.

MR. LEMEI: This is Galen Lemei with CEC Staff. And I just wanted to say that my interpretation of the statute, as written, is entirely consistent with Michael's.

I don't --

(Laughter.)

MR. SPEAKER: You're an attorney --

MR. SPEAKER: Wow.

MR. LEMEI: I think it's pretty clear

that the language, as written, anticipates 60 percent being a floor. The flexibility that we have is in -- to the extent that we have any flexibility is in determining what the numerator and what the denominators are. And in calculating that fraction. And that's, as I understood it, pretty much what Michael was saying.

But in terms of expressly under the current, you know, AB-1613 framework of -- existing framework, I don't think that we have the flexibility to establish a tariff for facilities that we are deeming to be less than 60 percent efficiency.

PRESIDING MEMBER BYRON: All right. Thank you for that.

Mr. Williams, did you want to add something?

MR. WILLIAMS: Sure. I could cover it also in the next question, but this may not be what the ARB intended. I'm back again on the issue of emissions reductions.

And, you know, clearly CHP has an industrial application as well as send electricity to the grid. So, when you think about, well, what would you have done otherwise, you might be

looking -- you might look also at the industrial sector. With a new CHP what would have happened otherwise? There may be some emissions reductions that actually come out of that sector for the 6.7 million metric tons. Maybe they don't all come from just selling excess electricity to utilities, particularly given the portfolios of the IOUs.

So, just maybe another way of trying to reframe how do you really count to get to that 6.7 million metric ton reduction.

MR. COLVIN: Again, Michael Colvin from the CPUC. I wanted to go back to a point that Marci Burgdorf made from SCE a few moments ago, talking about making certain that there isn't an actual heat need for the facility.

At least, in my view, I feel like it's very important for the Energy Commission as they're determining their guidelines, to be making certain that the efficiency levels are being met.

But in terms of application of those efficient technologies, it seems to me that's much more in the realm of the tariff design, and not in the technical guidelines. And not to say that we shouldn't have that conversation or should or should not. I don't think I'm particularly

interested in having the PUC going out there and saying, okay, did you really need that heat, or, you know. It seems a little --

DR. BARKOVICH: "Big Brother"?

MR. COLVIN: -- I will use Ms. Barkovich's term -- "Big Brother". But I think just for the purpose of what the conversation of what Art Soinski has to go out and do over the next couple of months, really figuring out how do we determine minimum efficient levels in an appropriate way. But I don't want us getting into the conversation of, well, we can use it for, you know, a commercial swimming pool, but not a residential swimming pool. Or we can use it for this, but not for that.

I don't think that's where the conversation needs to be headed. And I don't know if that's what you were intending or not, but that's what I was hearing. So I wanted to be very clear.

MS. BURGDORF: Yeah, point taken. That's not what I was intending. I was just --

MR. COLVIN: Okay.

MS. BURGDORF: This made available for use is very ambiguous, and I --

MR. COLVIN: I wholeheartedly agree.

MS. BURGDORF: -- think that really needs to be defined.

PRESIDING MEMBER BYRON: Mr. Szagner.

MR. SZAGNER: Hi, this is Joe Szagner, again. It's difficult to know if 60 percent helps or hurts the greenhouse gas cause.

Under an increasing electricity demand from the state, one might think that if new generation is developed it might displace new generation that would otherwise be developed on the grid.

And so one might tend to compare the efficiency of a lot of cogeneration plants, say 500 megawatts worth, versus using 85 percent thermal production at those sites, and a 500 megawatt grid plant, and one could take transmission, and so forth.

However, if we knew under that increasing electricity demand and declining greenhouse gas cap, what the end-game target is, what for this sector the average carbon content per megawatt hour needs to get to by 2020 -- and we really need to look beyond that, too, unfortunately, because these plants have a life a

lot longer than ten years -- we might be better informed to know.

If it turned out that we needed 900 pounds per megawatt hour as our average generation portfolio to get to our goals, that might inform that, hey, anything that meets or beats that is good, because it won't have the risk of displacing more efficient generation.

And the other thing is while a number of points have been made comparing a lot of the inefficiency of the existing grid power plants, I don't see the cause and effect.

If we install a new combined cycle plant, I don't know how that takes offline a 10,000 heat rate, or a 12,000 heat rate plant. I don't understand the cause and effect that if we have something bad and we replace it with something that's say, average, if that gets us to our goal or not.

We don't even know that it will even take that other plant off the grid, given that we have a growing demand, rather than supplant new generation.

So I'd like to explore what the thoughts are there, the theories. But in lieu of that, we

at least need that end-game standard. Maybe that will drive it.

So it's pretty hard to know whether this actually would help or hurt in the end game.

PRESIDING MEMBER BYRON: Yes. Mr. Collord, you have 30 seconds.

(Laughter.)

PRESIDING MEMBER BYRON: It's a difficult --

MR. COLLORD: Yeah, I don't know. I'm thinking I should refer to Dave Mehl. He's kind of the energy-neer in our unit, and probably has a better sense of that question.

PRESIDING MEMBER BYRON: It's a very difficult thing to answer. I mean there's a lot of effort going on over at the ARB. I'm not going to attempt to speak for them, but I know it's not an easy answer. We could spend a lot of time on that. But it's a good question, good question.

MR. SZAGNER: Well, I know from -- the EPA -- they have a full list and I assume that the folks in the state do, of all the generating plants in the state. We know how many megawatt hours are coming out of them; we know how much carbon we're getting from them.

So, in projecting demand and trying to anticipate what might be built or what we might need to get to. I know it's going to be some work, but it seemed at least the data's there to be able to arrive at something a little more numerical, I guess, or quantitative.

I don't know if that's possible, but it would really help us all know what the real target needs to be.

And I just want to add that I agree with Marci that we should build into the future, not out of the past. You know, technologies, efficiencies of new power plants likely will keep going up.

And so I agree that maybe standards, if you set them now, the implementation allows that they increase. So maybe every two, three, five years or at some important point we change the assumed standards of the alternatives, you know.

What must we assume for boiler efficiency and grid power plants. And then maybe the standards for CHP to be better than that have to change over time with them. So maybe we just don't pick one fixed number now, but have a process that allows a best available control

technology type process that moves with it.

PRESIDING MEMBER BYRON: Yeah, I get your point. A couple gentlemen have comments over here. Mr. Schoenbeck.

MR. SCHOENBECK: There's the answer to your question, you know, that's doing a production costing relation model run such as what Oregon did with the Aurora model.

But if the Aurora model's the entire WECC model, you can run the entire west coast. It has emissions for every unit, so you can determine how much carbon is emitted for whatever scenario path you want to go down.

But I guess where it is for me, that's a very complicated analysis. It requires all kinds of forecast assumptions you have to build into it.

But when we're talking that a current best available control technology in the plants that are being built in this state is around 52 percent on an HHV basis, in my mind you can get the greenhouse gas reductions with the 60 percent HHV overall total efficiency standard, I believe, in most cases.

There may be some assumptions because of thermal needs where you may not get it. But I

would certainly think in most cases it would be a net reduction in greenhouse gas versus what's being built now.

MR. SZAGNER: Well, 60 percent overall efficiency out of the CHP is equivalent to about a 46 percent combined cycle plant, just for referencing. That's at balanced thermal and electrical loads.

MR. SCHOENBECK: Yeah, but I went beyond the 60. Basically what I'm referring to all the state of the art CTs gas turbines are on now. You know, what you said, they're all in the 66 percent range. So that's what I meant by best available technology, that's what's there.

PRESIDING MEMBER BYRON: Mr. Davidson, do you agree?

MR. DAVIDSON: He covered it.

PRESIDING MEMBER BYRON: Okay. Covered it. In the interest of time, because we have spent a lot on this question, let's see how quickly we can move on to some of the other questions.

MS. KELLY: You might want to skip number two.

(Laughter.)

MS. KELLY: The next question is really just along the same line. We've sort of covered some of it. We're looking at is 60 percent the right amount for AB-1613, or is there another number like 65 that would give the most greenhouse gas reductions for all CHP, or is the number lower?

Does anybody want to add anymore? I think I've heard that 60 percent may be a good starting point. There's certainly a lot of other efficiencies that other people say the state should consider. But we have certain limitations within 1613, but I think that's the general message.

And so, add to that? Yes.

MR. WILLIAMS: One sentence only.

PRESIDING MEMBER BYRON: Please.

MR. WILLIAMS: We would support exploring size-differentiated efficiencies. We've thought about that a little bit.

MR. SPEAKER: Would you repeat, that didn't come through.

MR. WILLIAMS: I'm sorry. This is Ray Williams, PG&E. And we have thought about it a little bit. And we would consider or think it may

be worth considering size-differentiated efficiencies, or --

PRESIDING MEMBER BYRON: Meaning smaller units have lower efficiency thresholds?

MR. WILLIAMS: That may be the way it turns out. I'm not an expert, but that could be the way it turns out, yeah.

PRESIDING MEMBER BYRON: So why would size make a difference to what we're talking about here?

MR. WILLIAMS: I know that there's a whole host of technologies out there. I'm looking behind me to my expert if he wants to add anything, to Chris. And there's a whole host of thermal applications.

And when you run through all that, it may make sense to look at standards on a size-differentiated basis. We're just open to it, that's all.

PRESIDING MEMBER BYRON: All right.

MR. SCHOENBECK: This is Don Schoenbeck. Quick clarification, Ray. Are you talking about less than 20 megawatts? You'd do size differentiation between up to 20 megawatts, zero to 20?

MR. WILLIAMS: Yeah, possibly within the zero to 20 megawatt range.

MR. SCHOENBECK: Okay, thank you.

MS. KELLY: Any other comments on that question?

PRESIDING MEMBER BYRON: Art.

DR. SOINSKI: Art Soinski. One of the reasons I went through the history of the SGIP, and I meant to say, maybe I didn't, or maybe people didn't pick it up, is if you look at it like every three years there's a new law. And there's a new law in the hopper right now, in fact, relating to the SGIP program with respect to efficiency and technologies that get covered.

The reason I came down on the 60 percent side is for two reasons. One is my expectation that the administration of the program or legislation would potentially change it, if, in fact, it turns out that 60 percent is not giving us greenhouse gas reductions, or is not giving us CHP.

And the other is that beginning in, I believe, 2011 the ARB is supposed to make recommendations to the Legislature and the Governor with respect to success in meeting

greenhouse gas mitigation goals.

And because of the fact that the electricity sector is such an important part of the greenhouse gas mitigation, my expectation would be that the ARB would be making recommendations to the Legislature and the Governor concerning any deficiencies that they see in the program with respect to greenhouse gas reductions.

So, that's why -- I mean I think that 60 percent is a reasonable number going forward, because it's not something that is set in stone. And I really don't see that we're going to get the gold rush of thousands of megawatts of CHP in the next year or two with that efficiency level. Because there are other requirements, the interconnection, the NOx emissions, if it stays in the forecasting requirements and insurance requirements and the tariff, which may limit some of the small size.

So I think there's a lot of factors that could be conspiring, in fact, against a lot of CHP. And even at 60 percent.

MR. SZAGNER: This is Joe Szagner, again. Just one comment on number two, then.

While the 60 percent is one standard, one of the other standards proposed is a certain percentage above alternative, so above the SHP.

And to be able to synch those, those expectations, would be good. Because if, for instance, we take 5 percent better than an SHP alternative, you have to decide what the alternative grid fired plan is.

And if we have testimony or other things that say it's 50 percent, say, or 52 percent, by the time you add an 85 percent boiler, well, that standard's going to force your cogen to be at 65, 67 percent.

So if the intent really is to drive the 60, I'd just say that maybe that 5 percent above alternative, you have to have some mechanism of fixing the standard assumption grid power, the competing electric power, so that you get that desired outcome at whatever percent you want.

Because otherwise you go in with the hope of 60, but then somebody says, I can build a 55 percent high heating value plant. You have to assume that. That's going to drive you to 71 percent, and you're not going to be able to get that 60.

So, some way of linking those more strongly might be advisable to what your outcome is that you want.

PRESIDING MEMBER BYRON: Okay, well, there's at least two or three other factors that come into this, as well. Remember we're also talking about those new central power plants that you compare to oftentimes in the new additional transmission systems associated with them.

MR. SZAGNER: Right.

PRESIDING MEMBER BYRON: There's also the private capital aspect of this, which is lower risk for the investor-owned utilities' customers. So there's other factors that come into play here, too. So we may not get the percentage exactly right. We're trying to make it neutral, if you will, so that the utilities don't continue to appear as though they're obstructing CHP from going forward.

Right, Mr. Williams?

MR. WILLIAMS: Yes.

(Laughter.)

MR. SZAGNER: Yeah, I got you. I wasn't speaking of the standard, itself. Just that you have the two tests. Its own efficiency and the

efficiency alternative. And you might want to link those so you get the same outcome, whatever that value might be.

PRESIDING MEMBER BYRON: Okay. Any more on this one? Mr. Wong.

MR. WONG: I'll be very brief. I want to answer number two, I understand it interties with number one.

I once -- and it really comes down to do we do a command and control regulatory government approach, which is, I think the two individuals, Marci and Joe, is it? Saying we should build in higher efficiency numbers in here.

I've been a regulator both the federal government, USDOE, and for the Energy Commission. And I've been on the other side selling. And I want to give you an end-use perspective.

I think there's several people in this room in the audience that have actually sold this. And I'm going to speak, at least share with you the market-driven aspects of this.

Keith touched upon the economics. The more efficient units are going to give you better economics. So I made a presentation to a packing firm in the central valley. I had three things I

could sell. Microturbines, engines and Kawasaki gas turbine.

I picked the best one. I ended up losing this opportunity to solar turbines, and Lisa Conley, if you're still here, --

(Parties speaking simultaneously.)

MR. WONG: -- she went out, okay. They had a better package. And they were able to offer better savings. So the market was driving this. I was competing against everyone else, they were competing against me.

The other thing that has come into this whole thing with the Air Resources Board, the focus is on greenhouse gas reductions, now so much in the megawatts, at 4000 megawatts. I'm going to try and get the most efficient unit out there to get even better, I mean better in terms of CHP credits, or greenhouse gas credits.

And maybe the owner, the end user, can sell that. You know, I don't know what scheme is going to be developed from cap-and-trade. But, again, the market is driving this.

So, I'm going to speak out against regulatory situations here of a command and control, which have built up over time. The

market will take care of this. I mean I can personally attest to that.

PRESIDING MEMBER BYRON: Right. And it also ignores what the customer's interests might be, too. There are other reasons to do onsite generation.

MR. WONG: Correct.

PRESIDING MEMBER BYRON: Okay. I'm looking around hoping we can continue. Ms. Kelly, okay.

MS. KELLY: Question three. Is the previous self generation incentive program, which Art talked about this morning, when it still covers CHP systems pre-January 1, 2008, an appropriate model for documentation requirements on the proposed CHP system and all thermal system equipment, electrical and thermal output, performance and emission estimates, and CHP system design specifications and forms? Why or why not?

PRESIDING MEMBER BYRON: That's a long question.

MR. COLVIN: Michael Colvin from the CPUC. Again, I think the self -- I touched on this, I believe, in the morning, but the self generation incentive program was very much an

upfront payment, and did not pay per performance.

And that's a really important distinction, I think worth making, when you're talking about these technical guidelines. And the guidelines that were in the SGIP program, I think, reflected that.

So I think it's one just kind of very important distinction worth making. Especially when it comes to performance and emissions estimates.

PRESIDING MEMBER BYRON: Of course, this really has to do with, you know, is this the right documentation --

MR. COLVIN: Right, I understand. But I'm kind of wanting to make certain, for Art's sake, as far as, you know, the handbook that was developed, as far as the process that was developed, I think it's now a fairly good system.

I think we have a couple of lessons learned from the Energy Commission's New Solar Homes program and from our CSI program that might have improved upon that process a little bit. And if you're looking for a second model I might also look at that for the actual documentation process.

If you're focused on the documentation

process, I would, you know, look at both of -- look at SGIP, but then also look at the 2.0, if that's what CSI new solar homes program actually was.

PRESIDING MEMBER BYRON: Okay, thank you. Mr. Davidson.

MR. DAVIDSON: Keith Davidson. I filled out several of those forms. And I think the, in my opinion, the part of it that really is the weakest is justifying the thermal load.

You go through and the form has you put monthly gas usage. And then they calculate out the cogen system that you supply, and say, all right, how much per month would that thing produce.

And it does not reflect, doesn't take into account, doesn't make anybody think about what the diurnal variations are between thermal storage, if there's some weekly variations.

The whole thermal side of it, I think, needs to be a little bit more rigorous and make sure people are thinking about that.

And then, you know, go to Ray's point. I think it would be -- there are questions in there now, I think, that deal with plant

modifications plan, plant expansions plan, that kind of thing. So there's already those kind of questions.

But I don't remember seeing any questions about what else have you done energy efficiency-wise, and what other energy efficiency things have you looked at. That might be something good to add to the SGIP form if it's not there already. I don't think it is.

MR. WICHERT: Robert Wichert again. I'm back on slide 14, Art, and I think that you're going to need to add something to take this annual data. Unless I'm -- I may not know, but it looks here like you need the annual kilowatt hours and the annual Btus that are actually used by the process. And then there would be some ratemaking incentive that if you didn't meet this 42.5 percent, that you would actually be penalized somehow. That's the way I read this.

DR. SOINSKI: Well, I did talk about a penalty.

MR. WICHERT: I know, but there was some discussion in another presentation, I think, about a penalty. Today, not from you, obviously.

MS. KELLY: Okay.

MR. SCHOENBECK: This is Don Schoenbeck. Penalties, just to clarify in my mind, ultimately these systems are going to have some sort of a contract. And I think you have to harmonize the terms and conditions of the contract with the program and the products being offered.

Under the energy division's strawman's contract here, if it was assumed this was all going to be as-available power, there's going to be no firm power for the surplus sales.

And so I think the nature of a potential penalty in that instance, when what's being delivered is an as-available product, may not be consistent.

So I think ultimately when it comes to terms of the contract that's offered under this program for the surplus power and the performance should be linked in some way.

And I'm not sure, penalty for deliveries under an as-available product is appropriate. Something we need to think about some more.

MR. WICHERT: I apologize for bringing that up. This isn't the right forum for that. But it sounds here like on slide 14 that you want somebody to meet the 42.5 percent or else. Or

else what, --

DR. SOINSKI: Correct.

MR. WICHERT: -- I don't know.

PRESIDING MEMBER BYRON: Well, I imagine they wouldn't qualify for the feed-in tariff.

MR. WICHERT: Well, it sounds like it's an ongoing demonstration that you, in fact, meet it.

DR. SOINSKI: And the question, again that's where you get into the whole issue of compliance plans. And the issue of self certification versus somebody going back and checking.

The problem I have is if you have certain requirements and the expectations that you're getting a benefit presumably. Right? And I think one of the big benefits that the owner gets is the ability -- the design flexibility and operational flexibility that comes with the ability to sell excess electricity.

And so to my mind, with that there's also some obligations. And the legislation has said, you know, we're setting up this program; however, you have to meet certain requirements. What happens if you don't? Right?

I mean, if you -- so it's --

MR. WICHERT: Or else.

DR. SOINSKI: Well, I guess what is, I don't know, what would be the -- I mean, to my mind, what I proposed was somewhat of a fair alternative, which would not be onerous, and would not result in a plant being shut down and a contract being abrogated because of nonperformance.

DR. BARKOVICH: I think, though, that Don raised an interesting point, which is -- actually, to make it clear my clients intend to use any power they produce onsite. They're not planning on selling. I'm just involved in this because I'm trying to --

PRESIDING MEMBER BYRON: Right, all customers' interests are different.

DR. BARKOVICH: Right. Just to make that clear. But it seems to me that what people have said is true. You may have an application where at times you have surplus and at times you don't. So you're not engaging in a firm contract to sell a fixed amount. But it really is as-available power.

And I understand that you have to meet

an efficiency requirement, just like people have to demonstrate they made the PURPA efficiency requirement.

But, I agree, and this has nothing to do with me, but the concept of having a penalty for as-available is tricky. You should have to make your as-available -- I mean you should have to meet your efficiency requirement, but whether or not you produce power is just going to be a function of -- or whether or not you sell power is going to be a function of whether you have any to sell.

So, somehow we have to, you know, you have to meet your efficiency requirement, whatever it is, because that's your requirement. But, I don't know that you can link it to how much you have to sell at any given time, because there probably, I would assume there'd be two different -- essentially two different kinds of contracts.

PRESIDING MEMBER BYRON: Okay. Mr. Williams, when you talked about penalties, he got interested.

MR. WILLIAMS: Always. I know, maybe to your surprise, largely agree with Barbara. That an as-available product is not a product that you

should be penalized for if you don't happen to deliver on a particular day. That's the nature of an as-available product. It should be priced appropriately.

But with respect to meeting a certain efficiency standard, that needs to be addressed. I don't know whether if you don't, what the consequences are; whether that should be addressed here or whether that should be addressed in the context of the contract supporting the feed-in tariff; an open issue.

And, again, this is a theme of ours. I think you could look at this to some degree on, again, a size-differentiated basis where the contract or the penalty maybe is less onerous for very small facilities, and the cure period could be longer, you know. There may be some size differentiation with respect to that, as well.

MR. COLVIN: Michael Colvin from the CPUC. Just to quickly follow up on that. It would at least be my very strong preference-slash-very strong guess that any talk of penalties or noncompliance would be addressed more in the terms of the contract, and not in terms of the technical guidelines.

Art had a very, I think again, interesting idea on the last bullet point on slide 22 of his morning presentation. And I don't want to say yes or -- I don't want to put any weight on that or not, but I don't think that's the kind of thing that you would want built into a technical guideline. I think that's the kind of thing you would want built into the terms and conditions of a tariff. But that's at least my read of it.

MR. LEMEI: This is Galen Lemei from the CEC. I wanted to actually, I was about to say exactly what Michael just said. I'm not sure how the conversation got focused on penalties.

I understood Art's suggestion as part of the total regime, if you will. But that might be a way of addressing it. And obviously our guidelines are going to go hand-in-hand with the tariff contract.

But I would think that the question of penalties that solve, at least in my concept, would be formally addressed in the context of the tariff, if that were the appropriate -- if that, indeed, were the appropriate approach.

So, just from my perspective.

MS. BURGDORF: If I could make a quick

comment. This is Marci Burgdorf with Edison. We're going through contract negotiations over the next two days with all parties, so feasibly that will be addressed at some level in those negotiations.

In terms of enforcement I think along the lines I was thinking the technical guidelines and that there would be some remedies for if the generator wasn't meeting the efficiency level under the tariff in terms of ineligibility. And that there would be some remedy to make them whole again, or make them whole at the utility again, in terms of deliveries.

MR. LEMEI: This is Galen, again, with the CEC. If you don't mind me asking, what -- so you weren't submitting that our technical guidelines would have some kind of an enforcement remedy for breach of the obligations, as opposed to having that be a contractual issue? If that was what I understood you to say.

MS. BURGDORF: I mean I'm talking in terms of efficiency, so if they aren't meeting the efficiency requirements, if there's some guideline built in. There could be something in the contract, but there'd be something in the

guidelines in terms of monitoring and verification. That's where I'm going in terms of remedies, --

MR. LEMEI: I understand.

MS. BURGDORF: -- not penalties for nondelivery.

MR. COLLORD: Gary Collord with the Air Resources Board. I was just going to mention that, you know, to me this question is very difficult to answer, as well as the previous two, because we've had no discussion of really what we're hoping to accomplish under AB-1613 in terms of adding additional CHP capacity, or achieving greenhouse gas reductions.

And from ARB's perspective, that's probably the most important discussion we should have.

PRESIDING MEMBER BYRON: I thought our target was the scoping memos GHG reduction for this sector of combined heat and power.

MR. COLLORD: Well, if you look at the scoping plan measure for CHP it relies heavily on Assembly Bill 1613 for achieving the objectives.

But as far as I know there's been no connection made at the PUC or the Energy

Commission, for that matter, in terms of saying, yes, this is the tool, how we're going to achieve that goal. And this is the targeted number of, you know, systems we hope to bring online, or the greenhouse gas reductions we hope to achieve.

In fact, it's sort of our understanding that 1613 is going to be implemented fairly narrowly, and we're going to use a different proceeding at the PUC to try to address the CHP measure.

DR. BARKOVICH: No, I understand. This is Barbara Barkovich. I just wanted to follow on on what you said, because I totally agree.

AB-1613, first of all, is targeted to sales to the utilities. Doesn't mean you can't produce your own electricity and use it, yourself. Assuming that -- and reduce your indirect GHG by doing that.

And what hasn't been thought about, you're absolutely right, is with all the activity that's going on with respect to CHP, how does it all fit together to meet your reduction goals.

I think one of the -- I mean the reason I'm here is because I see some spillover there. But, first of all, if you're only dealing with

systems less than 20 megawatts, it's hard because you have to have more of them in order to even approach 4000 megawatts, assuming that's your goal.

And this particular vehicle, again, as I said, just deals with sales to the electric utilities. It doesn't deal with onsite usage.

So what it really needs to be is, if the state really wants so much GHG mitigation associated with CHP, and I'm not going to use the word megawatts, but, you know, so many million ton equivalence of CO2, then there needs to be a holistic strategy for CHP that looks at these different applications.

Because, you know, this is only targeted to one -- two -- well, one subset in two ways. One is size and the other is sale to the utility. And so you really have to look at the whole picture.

And, you know, Michael has that nice little box of his, in which he shows that only one quadrant is related to this. And that the rest isn't.

And so what we don't have is any overarching look at how to accomplish that CHP

goal. And I'm not sure -- well, and this came up, you know, this came up this morning when, you know, Doug was talking, you know.

How do we address the issue how CHP fits into cap-and-trade; how do we address how, you know, the different subsets of CHP that go towards meeting that GHG goal, whether it's within cap-and-trade or not.

It's like some kind of umbrella look that seems to be missing here.

So I'm really glad you brought that up, because I think it's important.

PRESIDING MEMBER BYRON: And it's a good point. And I'll take it a step further. We're talking about the regulated sector for less than 20 megawatts, which could be quite small.

There is also onsite that's generated onsite and used onsite. There's the greater than 20 megawatts. And then there's another whole sector that we're not talking about at this meeting, and that's in the public utility sector, which is about 25 percent of the state, as well.

So when you get all done maybe we're talking about 20 percent of the whole pie here. Just to pick a number. Ms. Kelly.

MS. KELLY: Yes. Just to that point I --

PRESIDING MEMBER BYRON: You don't have to raise your hand, by the way, you're the boss.

MS. KELLY: Okay. I just did want to address that because one thing we are doing is we are revisiting the assessment that actually led to that number that ARB used.

And in the IEPR we're going to be looking at the commercial sector, 1613, large, small, and try to get a better look at, you know, what the potential is out there.

PRESIDING MEMBER BYRON: Good, I'm glad you --

MS. KELLY: And understand it. And then we can then, as Barbara indicated, you know, get a better idea, and help ARB get a better idea of what we can do, where it is, what the barriers are, et cetera. So that will be done and be part of the CHP OIR in July.

And we will have that report done in July. So, I think that will help, Barbara.

PRESIDING MEMBER BYRON: I'm going to suggest we press on in the question category. Ms. Vaughan, do you want to come forward on this one?

MS. VAUGHAN: Oh, if --

PRESIDING MEMBER BYRON: You have to come forward if you want to speak.

MS. VAUGHAN: Just really really quick. I just wanted to kind of back up what Barbara was saying, and Gary and yourself, and Linda.

I'm Beth Vaughan with the California Cogeneration Council. And our membership is mostly between 20 megawatt, 100 megawatt size. So we're here more or less observing, not really actively participating --

PRESIDING MEMBER BYRON: Now you're participating.

MS. VAUGHAN: -- and really -- now I am participating -- really hanging out for this next CHP -- that's proposed. We have members who are currently installing new boilers because there is not an opportunity to install new CHP because they do have the excess they need to -- and we don't have a QF contract under the CHP contract.

So, I'll just throw that out there that we have, you know, there's opportunities out there now, and --

PRESIDING MEMBER BYRON: Are you suggesting that we're missing GHG reduction

opportunities in this state because the regulator is not acting fast enough?

MS. VAUGHAN: That is correct. Okay, so I was quick.

MS. LAWVER: I just wanted to follow up on the --

PRESIDING MEMBER BYRON: Please identify yourself.

MS. LAWVER: Oh, I'm sorry, Renee Lawver, Air Resources Board in the climate change reporting section.

PRESIDING MEMBER BYRON: Welcome.

MS. LAWVER: Doug Thompson is the section manager. I'm just replacing him for now, thanks.

Office of climate change is planning a workshop to specifically address SGIP issues associated with the cap-and-trade regulation development. So I just wanted to mention that.

And I'm just making a note that that IEPR update is going to be available in July, if you want to think about whether the cap-and-trade workshop follows that, or precedes that. And what's the best use of folks' time.

PRESIDING MEMBER BYRON: Okay, so, Ms.

Kelly, shall we try and go on to the next question.

MS. KELLY: Four. Here we go again with the ARB's mandatory greenhouse gas reporting guidelines apply to CHP facilities above a certain greenhouse gas emissions threshold and general stationary combustion facilities, among others. Are the ARB's reporting guidelines sufficient for satisfying the act's requirements on being environmentally beneficial? Why or why not?

And remember, these will be included in our guidelines. We are proposing to include them.

MS. LAWVER: Again, Renee Lawver at the Air Resources Board, climate change reporting section. It's our section that developed that regulation.

The regulation was developed to try to anticipate policy direction and provide as much information as possible.

So to the extent that policy direction is evolving, the reporting regulations don't define environmentally beneficial. It's just an attempt to collect as much information to inform decision, I think, as possible.

So we include electricity purchases to

inform indirect emissions, as well as stationary combustions and processing fugitive emissions.

DR. BARKOVICH: And this is Barbara Barkovich. I'll just say, because many of you heard me say this before, that we have some concerns as to how the reporting requirements address straight bottoming cycle with no supplemental firing, because they attribute emissions where we don't believe they belong.

And this is a to-be-continued discussion.

PRESIDING MEMBER BYRON: It is an accounting issue that we've got to get right.

MR. DAVIDSON: Keith Davidson. I was just struck by the difference in threshold for reporting for combined heat and power, which I think is 2500 tons a year, versus other combustion --

PRESIDING MEMBER BYRON: 2500 tons or 25,000?

MR. DAVIDSON: 2500 versus other combustion sources which is 25,000, Commissioner.

So there's a factor of 10-to-1 difference for combined heat and power over other industrial process equipment. And to me that

seems onerous and it's going to hinder combined heat and power and not help promote or foster combined heat and power.

PRESIDING MEMBER BYRON: Well, in fact, I was doing some quick calculations at the lunch hour, and I hope somebody can correct me if I'm wrong, but this 2500 metric tons of CO2 per year come out to something that's on the order of about 50 to 60 kilowatts of continuous --

MR. DAVIDSON: I figured -- I did it, I figured about a megawatt. But I could be wrong.

MS. LAWVER: Renee Lawver, Air Resources Board. Yeah, that was our understanding through the stakeholder workshops that it was equivalent to about a megawatt.

And the reason for the order of magnitude difference in the threshold for electricity sector and SGIP was to be consistent with the electricity sector, and capture as much as possible from an accounting perspective of emissions associated with electricity generation.

PRESIDING MEMBER BYRON: And also --

MS. LAWVER: That will continue to be revisited.

PRESIDING MEMBER BYRON: -- to be

consistent with the electricity sector, it's because these are stationary objects. And they're easy to, you know, find and go after, as opposed to the ones that move around.

MR. DAVIDSON: Yeah but a boiler that's stationary and staying there doesn't have to report unless it emits ten times as much emissions.

PRESIDING MEMBER BYRON: Okay, good point. And other comments on this one? Please, Ms. Burgdorf.

MS. BURGDORF: Marci Burgdorf, Southern California Edison. In terms of reporting I think the guidelines, themselves, aren't going to tell us whether or not it's an environmentally beneficial piece of equipment.

And we've advocated this in our comments with CARB is that there be some benchmark that it's compared against. And that would be the separate of a combined cycle gas turbine against a boiler.

And so the idea, you know, and I guess this term environmentally beneficial really needs to be defined, as well.

But what we would consider

environmentally beneficial would be that fewer emissions are produced with CHP than through a separate process.

DR. SOINSKI: And with no specific -- just like break-even plus a fraction of a percent or something. Is that basically what you're saying?

MS. BURGDORF: I mean, that -- yeah, that could be. You know, we haven't fleshed that out specifically. But that at least at some starting point to help determine what it would be.

DR. SOINSKI: That's interesting, because I made that suggestion to someone from the CPUC and they said that's a pretty small threshold. And my response was, well, if I get that much then I'm going in the right direction.

MS. BURGDORF: Yeah. Well, I guess it depends what you use --

DR. SOINSKI: Right, I mean that's the minimum, to my mind, right. And when I looked at the SGIP you don't always even reach that, I don't think. And that's the problem I have.

And then ideally you want to go on. I certainly agree that, you know, we should look at efficiency first. And we should, you know, try to

get that.

I thought about actually -- one of my drafts I actually proposed that people do a site audit and look at energy efficiency measures. This is after talking to Ray, because I agree with him about the importance of the load order.

But then how many burdens do you put in a program to try to achieve a goal. And I sort of -- I let it go, you know, I thought it was a good idea, but I'm not sure it's something that's practical within the context of this program.

MR. WICHERT: I would just say we had a very similar conversation. We thought -- inside the company. We thought it was a good idea to do the energy efficiency audit and try to think about ways that it wouldn't be too burdensome.

And thought about, again, for a, you know, a small cogen it could be something really very simple, maybe online versus, you know, a larger CHP where you may want to do something a little more sophisticated.

But then as to, you know, what you would do with it afterword, again, you know, it's that same sort of tradeoff. You don't want to be too burdensome in the regulation. But, you know,

there is a goal to be met. And, you know, we really couldn't come to a particular recommendation. But that was the way we talked about the issue.

MR. DAVIDSON: If I could just try -- I mean I would bet that most people have already done it. And you shouldn't require a new one be done if there's been one that's already been done.

DR. SOINSKI: Well, I'm not talking about having one done, period, whether you've done one before or not.

MR. DAVIDSON: Yeah.

DR. SOINSKI: I mean I think the prudent thing to do, and the wise thing to go, is to do energy efficiency first. But, to say that this program requires it, I think, is a step that --

MR. DAVIDSON: Yeah, I wouldn't do that.

DR. SOINSKI: -- I wasn't leaning to go to. I'm open.

MR. SZAGNER: This is Joe Szagner, Stanford. I'd like to add a comment, because energy efficiency is almost thought of as a demand side application very often.

And while there is efficiency embedded in the kinds of equipment we're talking, the prime

movers here, I think there's a large potential that hasn't been tapped yet. And that's energy efficiency on the supply side in terms of thermal.

I think in my comments to the Air Resources Board I proposed that, so this act doesn't become a hindrance to something even better, that at any combined heat and power sites that also employ central cooling, that, indeed, it not be voluntary, it would be a mandatory assessment of the potential for heat recovery.

I think in my example paper at the CARB we pointed out that at Stanford where we have a 60 percent cogeneration plant, we've just discovered a 70 percent overlap in our heating and cooling Btus in and out of that plant.

So, the buildings are essentially solar collectors, bringing us energy. And we've been using water and energy to dump that to the atmosphere.

Now, because I have a cogen plant today, under third-party contract, I can't implement that strategy now, because heat recovery is not thermally compatible with cogen, especially in the summer.

So the next five years, or however long

it takes, I can't take advantage of getting half my energy for free on the heating side.

So before we induce on combined heat and power plants at central heating and cooling plant systems that also have a cooling component, I really think it should be mandatory that they explore heat recovery. Because that has to be a separate heat and power application. It's not consistent with combined.

And you really foreclose that opportunity for a very long time for very significant free energy and greenhouse gas reduction if you don't at least tip off the site that, hey, there's this thing you should look at it and let us know if it has any real feasibility before we incentivize you to do another application that may be 20, 30 percent overall less efficient.

PRESIDING MEMBER BYRON: Mr. Szagner, thank you, you just answered a question that's been bothering me for many years about the cardinal cogen agreement. So, now I understand some of the concern there.

(Laughter.)

PRESIDING MEMBER BYRON: Any other

comments on this one?

MR. DAVIDSON: Well, I'll just say that --

PRESIDING MEMBER BYRON: A good answer is no, also.

(Laughter.)

PRESIDING MEMBER BYRON: Go ahead.

MR. DAVIDSON: That was okay. This is Keith Davidson. You know, there's a lot of reasons why all energy efficiency measures don't get implemented at sites.

And there's some good reasons why combined heat and power does get implemented before all the energy efficiency measures do.

Some energy efficiency measures aren't cost effective. Some energy efficiency measures are considered that they would interfere with production. Some energy efficiency measures are in buildings that might be shut down in a few years, and they don't want to make any more capital investment.

There's a lot of reasons why people in the industrial and commercial sector will not want to do every energy efficiency measure and implement it.

And I think for us to think that they should is naive. And I would, you know, and I would think a dialogue with the customer is appropriate to see what they've looked at. Ask them why they haven't looked at things.

But when you start talking about mandatory studies that are going to cost money and take time, we're going to say go away.

PRESIDING MEMBER BYRON: Yeah, the under-represented constituent here is the customer in today's meeting.

I'm going to ask Ms. Kelly if she'll press on to the next question.

MS. KELLY: Five. Should a CHP system commissioning test plan, a long-term monitoring and reporting plan, and a performance compliance plan be part of the application process? Why or why not?

And then just to the second question, if so, which organization should be responsible for reviewing the plans or is a self assessment adequate?

Art mentioned this earlier this morning. So we're looking just for input about what should be included and who should assure that the

facility's in compliance.

PRESIDING MEMBER BYRON: Yeah, I think we just got a good perspective on that. Mr. Davidson, do you want to repeat that answer again about going away?

(Laughter.)

MR. DAVIDSON: No.

PRESIDING MEMBER BYRON: Okay. Anyone want to contribute to this one?

MS. BURGDORF: I can.

PRESIDING MEMBER BYRON: Please.

MS. BURGDORF: In terms of the commissioning test plan, I don't really have any comments on that. I believe that that's a plan that's between the operator and the system generator. So I'm not really sure that the Commission should get involved in that kind of review and approval.

In terms of the verification and the entities that can do it, the list that you presented in your presentation, I think that we would support any of those entities doing the compliance.

And propose that maybe there be some combination of verification so that there's one

party that collects the data, another party that does the verification. And someone else that does the evaluation. Or some combination of that.

DR. BARKOVICH: You're beginning to make it sound very attractive to use the power, yourself.

(Laughter.)

PRESIDING MEMBER BYRON: ARB doesn't care. Right? As long as it's high efficiency.

DR. SOINSKI: Well, no, they have verification; they have independent monitor requirements --

PRESIDING MEMBER BYRON: Right.

DR. SOINSKI: -- on their program.

PRESIDING MEMBER BYRON: That's true. Do you want to say anything about this?

DR. SOINSKI: Oh, no, it's --

PRESIDING MEMBER BYRON: Okay. No, you're absolutely right.

MS. KELLY: Utility ownership of CHP systems, question six, is encouraged in the act. Should the guidelines apply to both utility and private party ownership? Why or why not?

PRESIDING MEMBER BYRON: Ah, Mr. Williams.

MR. WILLIAMS: Yes. Yes. They should apply equally.

PRESIDING MEMBER BYRON: Equally to both.

MS. BURGDORF: I'll agree and say yes it will.

MR. COLVIN: I'm more than happy to hear both of you say that. I would agree, for the most part, with the one clarification that I really do think what are these guidelines being used for. Well, they're being used for to make certain that we have a place to be exporting power via a feed-in tariff.

And a utility wants to try and bring a new, highly efficient, less than 20 megawatt system online, that's a CHP system. They're not going to sign up for a feed-in tariff, themselves. They would do it through a different mechanism.

And so I'm a little wary of the application of a utility-owned --

PRESIDING MEMBER BYRON: What mechanism would they use?

MR. COLVIN: Well, it's likely a bilateral contract, or and go through an RFO process. Most likely. I don't, if this is going

to be a utility-owned system then they're going to try and ratebase it, or they're going to try and do something, even if it's on a customer's site. And they most likely would file a joint power -- a JPA or PURPA. You know, some sort of other agreement other than what this would be.

But that's my guess, right. I could be completely wrong, but I don't anticipate a ton of --

PRESIDING MEMBER BYRON: Mr. Lemei may correct your thinking here.

MR. LEMEI: Well, actually I just had a question for Michael on this. I personally struggled with the language in the act that spoke to utility ownership under AB-1613, because I had a hard time wrapping my head around how the tariff would apply in that context.

That said, the language is there. And I just was wondering if Michael or anyone else, what they made of that language, and if they saw it as a statement of the Legislature's hopes and dreams, or if they actually saw it this tariff that we're developing as potentially somehow having -- or I should say, when I say the tariff, I mean the whole program, our lines and the PUC's

tariff -- if they saw the incentive program that we're developing -- programs that we're developing as having potential direct application to utility ownership.

DR. BARKOVICH: I think Michael -- this is Barbara Barkovich -- I think Michael said it well. If a utility's investing, I assume like Edison's photovoltaic program, and PG&E's new photovoltaic program, that they're thinking about ratebasing these things.

And that means that there's a very different compensation system than from a feed-in tariff. So, I'd be curious, as to one, whether the utilities are considering it; and two, whether they would disagree that if they're ratebasing it, a feed-in tariff would be inappropriate.

PRESIDING MEMBER BYRON: I was going to ask, as well.

(Laughter.)

MR. WILLIAMS: It's not the -- I would say, at this point, we're just sort of getting into this. It's not the first question that we're asking ourselves.

(Laughter.)

MR. WILLIAMS: It's pretty far down the

line in terms of utility ownership. And so we haven't really thought about the ratemaking. But, I guess the default is it would be ratebased.

And, you know, there need to be some way for us to be held accountable if we were going to go that route.

PRESIDING MEMBER BYRON: Ms. Burgdorf.

MS. BURGDORF: Yeah. I mean to the extent that we would, you know, apply under this tariff, we -- everybody should be held to the same efficiency and monitoring standards.

PRESIDING MEMBER BYRON: Good.

MR. COLVIN: Again, I agree with that. I didn't mean to take us down the wrong path, especially when we're running over our time period.

But, the one situation, to answer Commissioner Byron's question, and to answer Galen Lemei's question, the one way that I read this there could be some sort of co-ownership or joint ownership of the facility where, if the economics just couldn't quite work, that it was kind of a really interesting or good opportunity, there might be that possibility.

I believe SMUD is doing something

similar to that right now with a couple of their sites.

PRESIDING MEMBER BYRON: And I was going to bring up some of those examples, as well.

MR. COLVIN: And, you know, I would certainly be interested in seeing language on it, seeing, you know, if you're to negotiations tomorrow, if you -- if this is something that you're seeing a lot of potential out there for, you know. We'd love to kind of see more information about it.

Again, I don't think it's at the top of any one particular list of any of ours, but it is there. And it might, you know, -- we do have the opportunity to go beyond, as Mr. Lemei said, just beyond the hopes and dreams.

PRESIDING MEMBER BYRON: You know, there's another factor that comes to mind here, as well, and that is now that we've instituted MRTU, market redesign and technology updates --

MR. COLVIN: Technology updates.

PRESIDING MEMBER BYRON: -- and we will now begin to see locational marginal pricing, and we've done modeling here at the Energy Commission that indicates a small amount of generation in the

right place could go a long way to reducing congestion.

Utilities would be -- investor-owned utilities, you would think, might be the first to respond to that kind of opportunity. And one could envision where a couple of megawatts of generation, perhaps a joint project with a customer so that we're getting the high efficiency values of combined heat and power, could definitely go a long way to reducing costs for all consumers.

So there's other factors that may come into play here that could see an investor-owned utility get into this sector of the business.

I was just curious if you've thought about this at all, or are we just way out in left field here at the Energy Commission. Or at least this Commissioner.

MR. WILLIAMS: We haven't put all those thoughts together, so, thank you for doing that for us.

MS. BURGDORF: And I'm not involved in any discussions that would -- where I'd be able to provide you a specific answer to that, but we can provide in our comments some more specifics.

PRESIDING MEMBER BYRON: Okay. We're trying to help our investor-owned utilities appear, at least, to embrace the concept of combined heat and power as a good concept towards reducing GHG.

And I'm just putting forward maybe an idea that might have play in your company.

Any more comments around this topic?

Linda.

MS. KELLY: I'll just make one comment is that all the IOUs do participate in a PIER project, which is one of the first things you came to speak at. It was a PIER project that was looking at what would be the win/win/win for CHP.

And that was with EPRI. And that was done by E3, Snuller Price did that. And after a year and a half of study and utilizing his model, the win/win/win would be a CHP project that was owned by a utility. And there would be benefits for everybody there.

And that was one of the first things that you spoke at when they --

PRESIDING MEMBER BYRON: Right.

MS. KELLY: -- announced that there. So the idea is out there, for sure.

PRESIDING MEMBER BYRON: Thank you. And, you know, to speak to the one other issue that Mr. Colvin brought up, the publicly owned utilities, it's interesting, with a 40 percent lower, on average, lower rate structure, are now beginning to look at CHP opportunities. Why?

It's difficult to make them work economically. But maybe sometimes it's what their customers want. And we've seen a number of examples of POU/private customer kind of arrangements. And if it works in those lower cost service territories, just logic tends to tell you it might make sense in the higher cost service territories, as well.

MS. KELLY: Question seven. Should there be additional performance or reporting requirements within the Energy Commission guidelines? If yes, what are they? And why are they necessary. If not, why not?

MR. SZAGNER: This is Joe Szagner from Stanford. I would just comment again that I think we need more clarification on a) plant boundaries, and b) what's meant by thermal load.

That would be great to see. Perhaps a plant boundary definition might be limited to

equipment whose prime purpose is energy transformation or something. As opposed to doing process work.

Or some such means where you might include, say, chillers in the definition of a plant boundary, even if it's distributed chilled water generation around the combined heat and power complex.

Those chillers are there as prime pieces of central plant equipment for a specific purpose of energy transformation. Then you wouldn't have to draw your boundary to, you know, the heat exchangers and building efficiencies, these other very difficult things we don't want to get into.

But there needs to be some technical boundary of the central plant for cogeneration.

And then again, defining those common terms using Btu or something, and clarifying up that made available for use versus actually used kind of thing would be real helpful.

PRESIDING MEMBER BYRON: You know, we're certainly benefitting today by a lot of expertise around this table. I'm sure Dr. Soinski would welcome any input that you have about how to generically define that boundary, am I correct?

DR. SOINSKI: Very definitely, yes.
PRESIDING MEMBER BYRON: Okay.
DR. SOINSKI: And these terms. Because as I said, I've struggled with these terms because I looked at what's in PURPA; it doesn't mean anything to me. I couldn't, you know, made available for use, I honestly don't know what --
MR. SZAGNER: You're not the only one.
DR. SOINSKI: I honestly do not know what that means.
PRESIDING MEMBER BYRON: Oh, yes, thank you for PURPA.
MR. WICHERT: Is there any opportunity to use some term like actually used by the process? Or is that too specific?
DR. SOINSKI: If you want to propose a language --
MR. WICHERT: I mean that would be my instinctive reaction, would be actively used by the process. But maybe nobody else likes that.
MS. LAWVER: This is Renee Lawver. What I'm just aware of in my particular case, where several (inaudible), and then that customer (inaudible), so there's a contract to provide for thermal.

PRESIDING MEMBER BYRON: But it's not --

MS. LAWVER: But it's not always used.

PRESIDING MEMBER BYRON: -- always been used.

MS. LAWVER: So, and who is responsible for that.

MR. WICHERT: That's the difference.

MR. SZAGNER: And one other thing real quick. Even as it comes to natural gas, defining clearly what's the carbon content of combustion that's assumed, and what's the heating value.

You can find different values. We had some professors doing calcs checking our work, and, you know, they found different factors. And we had to argue what factors to use for what portfolio.

So, maybe the gas transmission or supply company comes up with that for all their users. But, you know, it would be tough to have one power plant in one part of the state saying, I'm using this assumed carbon content of combustion for calculating my GHGs, or I'm using this assumed high heating value if it's something different.

It would be nice to somehow standardize those so that you don't have all kinds of

different flavors.

PRESIDING MEMBER BYRON: Yeah, natural gas is used in a number of different sectors, not just this one. I think we'll count on our friends at the AB to give us a nice conservative consistent value for that.

MR. DAVIDSON: That's a good idea. Good idea.

MS. LAWVER: I would just -- as far as methodologies for calculating greenhouse gases, the reporting regulation would be the place to look for that.

MR. SZAGNER: Besides carbon content, would they also address the --

MS. LAWVER: Carbon content, -- test methods --

MR. SZAGNER: -- assumed -- okay.

MR. COLVIN: For carbon content I also believe the PUC and the CEC joint recommendations from October 2008 also say some stuff -- say some useful things that I'm certain Art's very well aware of, that will hopefully be used, as well.

PRESIDING MEMBER BYRON: You mean the 1100 pounds of CO2 per megawatt hour?

MR. COLVIN: I actually mean the fuel

intensity for when it comes to allocation purposes. Now I'm talking specifically for allowances, but it was based off of the point that Mr. Szagner was making.

MS. BURGDORF: This is Marci with Edison. Mine's more of a question than an actual comment. But in the statute it also does discuss that this program should be encouraged. The POUs should also be encouraged to develop a program.

And so my only comment here is that any measurement verification and guideline, I don't know to what extent you're sharing those, or working with the POUs to implement those? Of if you're aware of if they've started developing a program? But, either way, whatever guidelines are finalized here also be extended to that.

PRESIDING MEMBER BYRON: Yeah, they're missing a regulatory body to open a proceeding on this issue, on their behalf.

But I would imagine that we would expect the same application to the publicly owned utility sector as investor-owned.

MS. KELLY: We've met with SMUD, and SMUD is looking at this. They're looking at developing a tariff and a contract. I don't know

what the timeframe will be, but my guess is sometime this summer they'll bring it to their board. But they're definitely working on it.

Okay, last question. What other issues are important to this proceeding that have not been raised? So, is there anything we've missed, or anything at this point in time you'd like to put on the record for us to look into, or whatever? Michael?

MR. SZAGNER: Well, this is Joe Szagner. I'll just go again with mine real quick, then.

Again, I'd recommend that we look at the European Union standards. They set a CHP efficiency of 70 percent low heating value, or about 63 percent high heating value. And require that you also prove it would be 10 percent better than the alternative SHP.

And they must have had some reasons and deliberations going through that, so that might provide good reference.

I'd also recommend that we consider sliding scale incentives, so once we establish some benchmark that those incentives allow the more efficiency above that benchmark, the greater the incentive, if possible, to encourage even

more.

PRESIDING MEMBER BYRON: That's a great idea. But I tend towards Mr. Wong's statement earlier, the customer's already got plenty of incentive in place. The more efficient he is, the more money he saves, as well.

So, I don't know --

MR. SZAGNER: Fair enough.

PRESIDING MEMBER BYRON: -- as regulators, that we need to put more, you know, put more gold in the pot.

Those are good ideas, though. Thank you very much.

Any other? Please.

MR. DAVIDSON: Yeah, this is Keith Davidson. I still haven't, and I think this subject has been addressed by other people, as, you know, what greater good is AB-1613 really going to serve in terms of greenhouse gas emissions.

And I still wrestle with that. I'm not sure where all this effort is going to get us in terms of real benefits.

And I wanted to -- Lisa Conley from Solar Turbines, who's left, kind of raised it.

But I don't think -- I'm not sure if everybody here really understood what she said.

But I did a feasibility study for an industrial plant in southern California. And they had electrical that was 6 megawatts. And they had a much bigger thermal load than could be provided by an unfired 6 megawatt gas turbine. It was a Taurus65, it was a solar turbine.

And so you could supplementally fire it and get that extra steam. And when you supplementary fire a gas turbine your incremental boiler efficiency of that gas is what, is it like 95 percent, something like that. I mean, it's very very high. Much greater than if you were to make it in a stand-alone boiler.

And the other option, because AB-1613 was just passed, I made up some tariffs and I said, all right, well, what would it be if they went to a bigger system. They could have gone to a 10 megawatt system instead of a 6 megawatt system. But they wouldn't have the supplementary fire.

But what I didn't do is kind of look at, well, what's the difference in greenhouse gas benefits between the two. Because supplemental

firing gets you a lot of benefits, too. More so than just putting in a bigger system.

And I don't, you know, and I would think that, you know, unless AB-1613 was, there wasn't much risk for me doing that, the contract was secure and, you know, people weren't going to beat me over the head a hundred times, I'd probably -- the customer would probably go with the smaller system.

DR. BARKOVICH: Well, when you do that -- this is Barbara Barkovich. And I haven't thought about it in the context you're discussing it, but I know from some studies that have been done in the case of bottoming cycle, which is not what you're talking about, that you do get into some interesting issues with supplemental firing and meeting the SB-1368 requirements.

So, there are all these different criteria you have to meet at the same time. And I don't know if that would have been an issue or not.

MR. DAVIDSON: I didn't look at that. But the overall efficiency for the supplemental firing case was probably about 85 percent. And the overall efficiency for the larger gas turbine

was like 70 percent, 72 percent, something like that.

MR. WONG: Eric Wong. Keith, are you -- some of this sounds counter-intuitive to me. If you have 4 megawatts excess capacity from a 10 megawatt turbine, right?

MR. DAVIDSON: Yeah.

MR. WONG: Could you not have sold that?

MR. DAVIDSON: No, I put that in before the --

MR. WONG: You did put it in there, okay.

MR. DAVIDSON: I'm not sure. I was generous enough as the utilities are going to be, I'm sure --

(Laughter.)

PRESIDING MEMBER BYRON: Well, I think we're coming to a close. Any other topics that you'd like to discuss? Otherwise, I think Ms. Kelly is going to go over the schedule, and I'll make a few closing remarks.

MS. KELLY: Okay. For everybody, comments are due on April 27th. The directions are in the -- this is a docketed proceeding, so the directions are in the workshop notice, just

refer to that for filing your comments by email or by mail.

The next event for us is June 15th. We will post our staff draft's proposed guidelines. These will be the actual fully written out guidelines with all the details, definitions, et cetera.

We'd like comments two weeks after that on June 29th. And then in mid-July if there is a lot of comments and we have -- we're not really close on closure, we could have a workshop if we feel it's necessary.

But if not, then what we'll do is that we will then post our final recommendations for the guidelines. Then we will have a workshop on September 16th with this Committee to get your comments one last time on these guidelines. And then on September 30th we'll get written comments.

And then if there isn't any substantial changes after that period of time, then we'll go, on November 18th, to a business meeting for a final approval and adoption of these guidelines.

Is there any question about this schedule? We're going to try, like Michael, to get everything done.

PRESIDING MEMBER BYRON: And, of course, this is one of many moving parts to the Integrated Energy Policy Report. I'm just going to pick a number. One of about 30 parts, perhaps, that all come together in that timeframe.

I think we're just about done. Let me say a few things. First of all, I'm really pleased with the conversation that I've heard today, initially from the Public Utilities Commission, Mr. Colvin, it's great to have you here.

It's really important that the two Commissions continue to work together, make our schedules as consistent as we can. We have different obligations driving our interest -- I mean, sorry, our needs to get things done.

But our long-term interest is really the same. And it is interesting to hear the comments around AB-1613 and how effective it will be. I can tell you that the efforts that the Assemblymember put into that were extraordinary. Maybe there's other things that can be done.

And I think if you've ever met with Assemblymember Blakeslee you know he's interested in your input.

Having said that, I'm also very pleased when I read through your presentation, to see the innovative thinking that's underway on the part of the PUC, when I saw this characterized like a feed-in tariff. I found that very interesting.

And I think it is. I mean it's very similar, it's not quite a good as renewables in terms of GHG reduction, but it certainly is a lot cheaper. And that's part of why we think this is so important to contribute toward the ARB's GHG reduction goals and their scoping memo.

Some of the other things that I did want to mention, and we had opportunity to bring them up briefly, are thinking even broader than we are right now. I think MRTU may afford us some new opportunities here to reduce congestion, which saves money, which has value. And perhaps, in the long run, could feed into a, I'll use the term, feed-in tariff, as well, for generation.

And the other topic that came up towards the end, that I agree wholeheartedly with, is looking at other sources of information. The publicly owned utilities, the European Union, forgive me, who brought that up. There are other states. Mr. Davidson brought up Oregon.

There's a lot of examples that show a different approach that could be beneficial to us here, and that we should certainly consider these in our thinking as we move forward with your proceeding at the PUC.

I've certainly instructed my staff to consider all that additional input. But we still have to fulfill that AB-1613 requirements.

One last thing, and that is I'm concerned, and this came up today, as well, about the lack of participation, if you will, on the part of the parties.

I'm very pleased to see some of the folks that are here, whether they're just monitoring or sitting at the table, there is still some interest in this area. There are customers that are interested in combined heat and power.

And I think it's incumbent upon us, as state regulators, the two Commissions here, to try and make sure we keep this market as open as possible. There's some conflicted interests that seems to limit the CHP opportunities as they exist today.

And therefore, I know that you're having some discussions at the PUC -- Ms. Burgdorf

referred to them -- in the next day or two. The parties are getting together.

In fact, I don't think many people understand that. The parties are going to be meeting and see if they can come to some sort of agreement.

So, as I see it, they're doing the PUC's job, is that right?

MR. COLVIN: Oh, I wouldn't go that far.

PRESIDING MEMBER BYRON: Well, you're sitting next to someone who has told me before that the PUC has not ever -- hasn't done any tariffs in the last 10 or 15 years. It's always the parties that get together and do that.

DR. BARKOVICH: We settle.

(Laughter.)

MR. COLVIN: To illuminate what Commissioner Byron is saying very quickly, --

PRESIDING MEMBER BYRON: If you would explain that briefly, it would be helpful.

MR. COLVIN: Yeah, of course, I'd be more than happy to. And I believe that I alluded to this when I was talking about the timeline this morning.

There are, from the draft straw proposal

that we released in February, and after we'd workshopped it, several of the parties said, look, there's some things that we think we want to change. We want to be able to kind of recommend.

And rather than getting from 20 different parties 20 different, slightly different proposals, and trying to aggregate them all together, there's a lot of changes that could happen that are probably very easy to come to some sort of tentative agreement on.

And one of the things that we really try to encourage through our process is anything that's going to be formally adopted will be adopted, you know, by use. And it's not just the people that show up at the table.

But for the parties who want to be able to say, okay, you know, we have these 15 issues that we think are a point of contention, and we think we can come to an agreement on these six.

Then the issues that have to get moderated and dealt with by the PUC have been reduced by six. It's just one way of doing things.

Certainly we're going to look over and read everything, no matter what. It's just a way

of trying to make it at least somewhat simpler.

The second half of the conversation is at least this opportunity will, regardless of if there's a missing market, if the market is not being fully represented by people, if you're not able to participate in this stage of the game, in this process, at least this will allow the three utilities to be able to come to some agreement on one particular -- parts of things, so that there aren't three different tariffs from three different utilities. And I think that's one of -- that's a main benefit.

There will be certainly many other opportunities to participate. This is not the only one. But this is -- there's a set of negotiations that will happen this week to at least try and nail down some of hopefully the less contentious issues that are around.

PRESIDING MEMBER BYRON: All right, thank you, Mr. Colvin.

And that leads me to my point. I have a couple of letters that have been sent to the assigned commissioner on this, and a number of these organizations have indicated that they've elected not to participate.

I don't want to suggest why, but I think we know that it's partially, it's expensive. The procedures that we've set up at the Public Utilities Commission, and perhaps even here, it costs money to play.

And I've had more than one of these organizations tell me today they don't have that money. I mean, it's very difficult for them to participate.

So, hopefully coming to Sacramento is the low-cost approach, and we appreciate you all being here.

To finish I'd really like to thank you all. There's a tremendous amount of expertise in this room, around this table. I certainly benefitted tremendously. I believe my staff did, as well. And I would like to thank you for taking the time to be here today.

I think that's all we're going to cover. Thank you for staying late. We'll be adjourned.

(Whereupon, at 4:11 p.m., the workshop was adjourned.)

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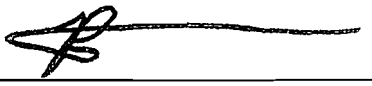
CERTIFICATE OF REPORTER

I, PETER PETTY, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Committee Workshop; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said workshop, nor in any way interested in outcome of said workshop.

IN WITNESS WHEREOF, I have hereunto set my hand this 7th day of May, 2009.



PETER PETTY