BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. UNDOCKETED

In the Matter of

NET METERING OF CUSTOMER-OWNED RENEWABLE GENERATORS.
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| PROCEEDINGS: | STAFF WORKSHOP |
| DATE: | Wednesday, April 18, 2007 |
| TIME: | Commenced at 9:30 a.m. |
| PLACE: | Betty Easley Conference Center<br>Room 148<br>4075 Esplanade Way<br>Tallahassee, Florida |
| TRANSCRIBED FROM TAPE BY: | JANE FAUROT, RPR<br>Official Commission Reporter<br>(850)413-6732 |

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P R O C E E D I N G S

MR. HARRIS: I guess we have some legal notice or something like that. No.

Pursuant to notice issued on March 22nd, we've set this for a staff informational workshop regarding net metering of customer-owned renewable generation.

One thing you need to know, this is being recorded. We're going to have it transcribed, but the court reporters are taping it. We have it being taped, and then they're going to transcribe it. So whenever someone speaks, and it's very important -- my name is Larry Harris -- it's very important that you introduce yourself so that the court reporter will be able to pick that name up when they go to transcribe it. I'm sure Jane has heard my voice enough in the past few days that she knows who I am.

So when you come up to speak, you need to have a microphone so it can get recorded, and you need to state your name, so it will be in the record. So when the transcript becomes available, people will be able to go back and look at it.

This is an undocketed matter right now, so there is no way you can go on the website and pull this stuff up. Once it becomes docketed, all these things will be moved into that docket file.

MR. GRANIERE: (Microphone off.) -- Florida is that

net metering is not mandatory. It is optional and at the discretion of the utility. So I think the first question that I will ask, and I don't see -- Susan will probably be the one who has to answer it, unless someone else there in the audience wants to answer it -- is what is the benefit to Florida of not having mandatory net metering?

MS. CLARK: Bob, that's a little hard to answer until you -- until we have a clear definition of what you mean by net metering and what you believe should be entailed in net metering. One of the concerns we have is what is -- if you are going to allow net metering, what is the technology that's going to be covered or to which net metering will be offered. If there is excess generation, at what rate would the generator be paid for that excess generation.

We are concerned about cross-subsidization issues that can be attendant to net metering. So primarily we are here to gain and listen to the information from the staff and those entities that are interested in having net metering.

MR. GRANIERE: Okay. Well, Susan -- Bob Graniere.

Susan, I totally agree that, you know, the utilities should hear what we think about net metering, but I think it's only fair that the staff here learn about what the utilities think about net metering since this is an informational workshop, and the information generally goes two ways. So I think that, you know, we need to do that, because one of the

purposes of this workshop is to talk about putting together -- well, the possibility of putting together a new rule that will take into consideration the concerns of all the parties before we draft the new rule rather than after we draft the new rule, thereby expediting our capabilities to move rules along, which takes rather long here in Florida.

So I do hope, and, you know, sincerely do hope that the utilities do decide to come up here and give us their ideas of what net metering is, what cross-subsidization is, and basically which is everything that's on the agenda, and which were the questions that we put out there.

We are, of course, prepared to talk about what we think they are or are not, but I do hope that you all come and tell me where I'm wrong, or tell us where we are wrong, because, otherwise, I mean, all we'll know is that, when the rule comes out, assuming that it does, all we could say is, well, you know, this is -- we did this without the guidance of the utilities.

MS. CLARK: Bob, let me be clear. We intend to fully participate and provide our ideas and recommend ways to approach it.

We can start with the definition of net metering if that's what you would like to do, the first question that you had. As you indicated, there is a definition of net metering in -- I don't know if it's in PURPA, I guess it is in PURPA, as

it was amended in 2005. And they defined net metering as service to an electric consumer under which electric energy generated by that electric consumer from an eligible on-site generating facility and delivered to the local distribution facilities may be used to offset electric energy provided by the electric utility to the electric consumer during the applicable billing period.

We believe, consistent with that definition, net metering should be defined as a billing arrangement whereby electricity which is self-generated by a customer behind the utility meter is netted against or subtracted from the electricity consumed by that customer behind the meter over some length of time. And, certainly, we need to talk about what that length of time should be.

MR. GRANIERE: Okay. In your definition of net metering, would it be possible for the meter to run backwards?

MS. CLARK: I think there are some that do it that way. I'm just drawing a blank right now. I think there are some that do run the meter backwards, and I think there are others that do a dual meter.

MR. GRANIERE: Okay. If they were to do the dual meter, how might that work in the sense of -- would it simply record the amount of electricity that is being sold back to the distribution network, or would it record all of the electricity that's being generated there and then that netted against what

is being drawn in, or how would it work? How would the two meters work?

MR. LANE: When a utility --

MR. GRANIERE: Your name, please.

MR. LANE: Tom Lane. When a utility uses a dual reading meter, it's usually a digital meter. And the power that's produced by the solar system that's actually used in the building is not recorded. It's only the power that's going back into the grid that's recorded along with the power going in. For instance, most dual reading meters are digital, and they will hold up a number for about five to seven seconds. That's the amount of power that the utility pushed into the building. That will blink off for one second. And then for about five to seven seconds it will hold up what was pushed back into the grid. But that does not in any way show what was actually used in the building.

MR. GRANIERE: Okay. So if I understand it, what would be -- Bob Graniere. What would be read on the outgoing part of the meter is only the amount that was not used inside the building and pushed to the grid, or pushed to the distribution network?

MR. LANE: That is correct. Some utilities just use a conventional meter and don't even care -- the little disk that spins actually would spin backwards. But in some cases, if a building has a small system, and there's a large

consumption in the building, especially with network servers, you won't see hardly anything go back. But if there is a time period where there's not a lot of use, you will see a significant amount recorded that actually went backwards into the grid.

MR. GRANIERE: Okay.

MR. REEDY: Comment, please.

MR. GRANIERE: Sure.

MR. REEDY: Bob Reedy. I would just suggest that we just go to the definition of the word net. And a net meter is a summation of what's going and coming. And if it's dual metered, it's not net metered. Net metered means you sum what's going in and what's going out, which means that if there is more being generated behind the meter it will run backwards or register a negative. And if it's less, there's more load than there is generation behind the meter, then it will be a positive reading.

And I think really pretty straightforward that net metering is exactly net metering. And that's been found pretty well around the country to be the definition, I believe, of net metering. There are certainly many different terms that are applied, but usually that has to do with how you compensate. But there has really not been a whole lot of discussion of what net means. So net is net.

MR. GRANIERE: Bob Graniere.

Thank you, Bob. This will be hard, Bob and Bob. How about Robert, is that better for you?

MR. REEDY: My mother calls me Robert, so --

MR. GRANIERE: Okay. Then you're Bob.

Okay. I think now that we sort of have a sense for what net metering is, we could start the -- you know, now, I think, everyone listen to what our two people from the solar industry have to say at this workshop. Now that we all sort of have a general idea of what we're talking about here on net metering and not -- so we don't have to, at this point, get tangled up in some niceties about the definition. Okay?

So, why don't you take your time to give a comment right now?

MR. LANE: Usually net metering --

MR. GRANIERE: Please say your name first.

MR. LANE: Tom Lane. Usually net metering in most places is considered, you're getting the exact same amount for what goes out as what comes in. In states that have net metering law, the utility pays you the exact same amount for what you push out as what they push in. Otherwise, it's just a recording operation.

MS. CLARK: Bob, this is Susan Clark.

I take that to mean, by that comment, that when it is netted, in effect the excess or the customer is getting credited at a retail rate as opposed to an avoided cost rate.

MR. GRANIERE: Bob Graniere.

Susan, yeah, that's my understanding of what he just said, that the compensation would be at the retail rate.

MS. CLARK: And I think it needs to be understood that that would involve a subsidy from other customers if the retail rate is paid, because the retail rate includes in it things in addition to generation, which would not -- for which then that customers would not be paying.

MR. GRANIERE: Okay. Bob Graniere.

Susan, I'm aware of these subsidy and cross-subsidy arguments about earning a retail rate when it's paid back. And I think that's something that we will have to talk about in more detail later in the workshop and get a better understanding for what we're actually talking about in terms of subsidies, where they're coming from, what's causing them, and why they allegedly exist or do not exist. Because, as you know, there is differences of opinion on this on both sides. So it would be useful for us to get down and work that out later on in the workshop.

MS. CLARK: I would be interested in knowing for those who -- if the argument is it is not a subsidy, what the rationale and a little more information about that.

MR. GRANIERE: Sure. Absolutely. You know, I will give you my best rendition of what my understanding of that argument is, okay?

Do you have anything more to say?

SPEAKER: Well, I think we've pretty much defined what the definition of net metering is, which was what we're talking about at the moment.

MR. GRANIERE: Do you have any -- Bob Graniere, once again.

Do you have any more like prepared statements that you want to make or would you just prefer to chime in at any time?

MR. WALLACE: I have some comments I'd like to add. Wayne Wallace here.

I'm here representing the solar industry, some concerned citizens that have solar systems, residentially and commercial, and also some concerned citizens that would like to have solar electric systems, specifically photovoltaics, known as PV.

Here in the sunshine state, our most abundant resource is solar energy. I don't need to really tell anybody that, that's been known and known. There are 23 states in the country that have renewable portfolio standards, and for us to have net metering here in Florida is something that I -- you know, so many people that I run into daily, commercial clients of ours, residential clients of ours ask why don't we have more solar in Florida? Why can't we get net metering in Florida? Some of the utilities do offer it, and some want to give you

the offset cost.

You know, just in this week's paper, seeing here a report from Environment Florida, Florida was number two in carbon dioxide emissions that were raised from 1990 to 2004. You know, it seems like you can't pick up the paper anymore, any paper across the country, for the effect of what global warming is doing here. And, of course, I'm not here to argue if we have a problem with the global warming or not. I just simply think, you know, doing some solar energy in Florida is certainly the right thing.

There was a study by the Florida Solar Energy Center on the impacts of investing in solar energy. And if our customers and Floridians can have net metering and get the full retail price, it's something that they will want to do.

Electricity in Florida is generated mainly by coal. And coal, as we all know, is full of carbon emissions. Some of the dirtiest plants in the country are here in Florida. I know some of the utilities are doing a lot of good things to clean that coal up.

This study that the Florida Solar Energy Center did, if we could add a dollar a month to the electric bills, we could reduce electric usage by almost 4600 gigawatt hours a year, save ratepayers in Florida almost $460 million annually. Eliminate almost seven million tons of carbon emissions in Florida. That doesn't even begin to count for economic

benefits. So net metering is something that a lot of Floridians want. We ask our customers constantly, the people that want to do their part to help reduce emissions and do solar energy.

The Department of Environmental Protection here in Florida, we have a program that has a four-dollar watt buydown on solar energy equipment. And for commercial it's a $100,000 rebate, if you're a commercial client and you want to do a good clean green thing on your building and for your customers. That equates to a 25 kW solar electric system where we currently have a 10 kW utility interconnection agreement, which that's something tomorrow I understand the PSC has a workshop on.

But the net metering, we still don't in Florida have a true net metering arrangement, and that's something that the solar industry certainly would like. But mainly Floridians, people that we come in contact, ask all the time why don't we have this. So I'm certainly here to push -- in fact, there's customers in the audience here today, Mr. and Mrs. Wagner that have a solar electric system at their home. Thank you so much for your system that you have. And they, of course, would like to have net metering. Anyone that has any sort of solar electric system to help do the right green, clean thing should get net metering. So, thank you.

MR. GRANIERE: Okay. Thank you, Mr. Wallace. I

certainly appreciate your statement.

And to you in the audience, I have your letters. As you mentioned there was a Mr. Wager. He's over there. Stand up, please, and say hello. There you are. Good. He has a solar system on his house, and he would like net metering.

And then we have a Mr. Stamper.

SPEAKER: (Inaudible. Not at microphone.)

MR. GRANIERE: Well, why don't you come up here and talk.

SPEAKER: Yeah. Come on, Mike.

MS. HARLOW: Can I ask Mr. Wallace a question while we're --

MR. GRANIERE: Sure.

MS. HARLOW: -- waiting to fill the time up.

Mr. Wallace, I'm Judy Harlow with the Commission staff. And it's my understanding you've had a lot of contact with solar customers and customers that are interested in putting in new systems.

MR. WALLACE: Yes, ma'am.

MS. HARLOW: What I wanted to ask you is I know we have a lot of incentives out there right now, government incentives for these systems. There's a federal tax credit. We have state rebates. And the City of Tallahassee has also, apparently, recently initiated a pretty aggressive program. What I wanted to ask you is do you believe that net metering,

the absence of net metering in Florida is preventing new customers from installing PV systems?

MR. WALLACE: Specifically to answer your question, I will say yes, because we have had some people -- that along with other obstacles, of why they wouldn't do it. I mean, for example, the homeowner association wouldn't let them put the solar up, and they had to move it, and they were getting all kinds of, you know, bad publicity from the homeowner's association. That was one issue. I will say a lot of people still do move forward with the solar system, regardless of that, but it does have a positive impact. If net metering were true net metering for them to get that retail monies credited on their bill, it definitely makes an impact to help them make that decision to invest in green, clean solar energy.

MR. GRANIERE: Thank you, Mr. Wallace. This is Bob Graniere again.

Is a Mr. Chandley (phonetic) out there or his representative?

MR. BROWN: Again, Michael Brown, Solar Ray, Inc. I'm representing Mr. Chandley, as well.

MR. GRANIERE: Okay. Great. Okay. Well, what comments --

MS. CLARK: Bob, can I interrupt just a minute?

MR. GRANIERE: Sure.

MS. CLARK: Mr. Wayne asked me who I was here on

behalf of, and I think that's important to get on the record.

I'm Susan Clark. I'm with the law firm of Radey, Thomas, Yon and Clark, and I'm here on behalf of four IOUs; Progress Energy, Gulf Power, Tampa Electric Company and Florida Power and Light.

And I'd like to say one other thing. We are very supportive of renewable resources to the extent they benefit customers. We're here to listen and learn and understand what those benefits can be.

With respect to net metering, I think we need to be careful about embedding in the definition of net metering the notion of being credited at retail rates. Now, if that ultimately comes to pass, then I think there needs to be, as part of that, a real consideration of what types of renewables need to be promoted through this type of arrangement and what is the public policy we want to achieve through promoting that. And as we go through the questions, I think we'll have some ideas regarding that.

MR. GRANIERE: Once again, Bob Graniere.

Susan, thank you, you know, for that clarification. I think you're right on the money, that net metering is not as simple as it looks when you get down to the implementation stage and we need to work these things out. And I'm happy to hear that we're going to be here to talk about all those things and try to at least get a first take on where we all stand on

that. So thank you very much.

Yes, sir.

MR. LANE: Tom Lane, again, with ECS. I'd like to point out there's one huge negative in this state on solar electric systems and that exists, the property tax which we lost. In many cases the property taxes on solar electric systems that cost 30 to $50,000 take anywhere from one-quarter to one-third the savings each year.

MR. GRANIERE: Well, I do -- once again, Mr. Lane, I thank you for your observation. And I do understand that making any home improvements, so to speak, has an effect on someone's taxes. It is a real problem. And the Legislature is working diligently, I understand, on property tax relief. And maybe a sufficient change will be made or not made on the solar exemptions or absence thereof. But I just would hope that, you know, you could sort of focus your comments mainly on net metering for us here so that we could stay on point. Okay?

MS. CLARK: Bob, I don't mean to interrupt. This is Susan again. It just seems to me that those -- it's helpful to understand those issues, too, as to what is the best way to incent appropriate renewable resources. And I think that the notion of the property tax does make a good point. Is that a more appropriate way to incent customers, and is it more beneficial to them.

MR. GRANIERE: Well, I would guess the property --

this is, once again, Bob Graniere.

You know, I would always think that property tax relief would be a wonderful way to do it. But I think we may want to consider the fact of getting a completely broad approach to encouraging these technologies, which mean that not only a legislative initiative is necessary, perhaps, a regulatory initiative also would be helpful, too, in promoting these technologies.

So, yes, I mean, the more benefits the better in terms of promoting solar, but I don't think that it's something that should be restricted to one branch of government or one agency. I think we all should talk about it, and sort of make decisions as to what we all can contribute to this as opposed to the other guy can do it.

MR. BROWN: Michael Brown. I'm representing quite a few photovoltaic customers, renewable energy generators in Central Florida, including Mr. and Mrs. Wagner, Andrew Stamper, and Dick Chandley, which you have letters from, along with more that I don't have letters for.

The concern is mostly -- they've already expended a lot of money. Even with the incentives on the rebate program, the customers have expended quite a bit of money. The only people that are actually going into the PV systems are the people that are dedicated to being green and dedicated to renewable energy. You know, they actually see the need, and

they see that we really need to reduce our dependency on not only foreign oil, but also on combustibles, you know, coal, everything else. There's a lot of negatives that go into generating electricity that way. So their only benefit, outside of reducing their electric bill is to try to get the true dollar-for-dollar for what they cogenerate.

For a customer to actually have a system sized enough so where that they would really be producing a surplus back to the grid is almost not going to happen. I mean, it's going to be a very rare thing. The customer would have to be going through a lot of additional energy saving programs in order to get to that point.

Most people aren't trying to make money on their system. In fact, you know, that's not even an issue. Nobody wants a check. Everybody understands that even if they were to generate more than they consumed, that they would only be allowed a credit which would be negated at the end the yearly billing cycle, which is -- I don't think that's a law, but that's what I've read into quite a few interconnection agreements.

But seeing as how these customers have put out what they've put out in expenditures -- I mean, for a 2 kilowatt system, which is the minimum system size to take advantage of the Florida state rebate program which is in effect now, a customer is going to spend, by the time they have the system

installed, they're going to spend a minimum of $16,000, and they are only going to get $8,000 back.

So you can't talk to a customer about payback, but you can talk to them -- or what we can do is try and help them realize a greater return on their investment. Because it is an investment. But it's not just an investment that they're making for themselves or their own property, it's an investment that they're making for their community, it's an investment that they're making for the state, it's an investment that they're making for the world. And I think that that needs to be recognized.

In 38 other states we have net metering agreements. And it just -- if they were generating vast amounts of electricity so where it was taxing the grid, then I could see a concern about making sure that you held back the cost of line charges and such. But the customers are -- like I said, I don't know anybody that is zero on their energy consumption. And so I guess that's all I have to say.

MR. GRANIERE: Bob Graniere again. So what I'm not understanding is that the net metering is sort of like a -- is it the fact that the net metering and getting the retail rate -- let us assume for the moment that that's just the vague definition of it, is that that's sort of like a peripheral something that just would be nice, but is not really motivating?

MR. BROWN: Well, a lot of customers look forward to that. They didn't assume that -- they assumed that that was the case before they got into the situation. You know, once they got into the situation, Mr. Wagner and Mrs. Wagner, I think I made it clear to them that their utility was not a net metering utility. We have utilities in the state that voluntarily net meter, which if the definition we go by is the one that Bob presented earlier, then that would be that they're given a credit dollar-for-dollar. But it is a concern for customers that aren't as dedicated. And I think that we should do everything that we can to promote renewal energy in the state and to realize that we are dependent on finite resources. And the sooner that we can start to build our supply of non-finite resources, renewable resources, then things are going to get better.

MR. GRANIERE: Okay. Let me follow up. Bob Graniere again.

Let me follow up on Judy's question that she asked earlier, which is to the best of your knowledge has anyone every walked away from a solar installation because there wasn't any net metering?

MR. BROWN: It's been one of the concerns, but, yeah. I mean, I talk to customers all the time. I get calls from out-of-state people moving into the state, and there are a number of concerns. And, yeah, that is one of them, because

you have to be up front with the customers. It's a huge investment. And so -- I don't know if I'm answering the question.

MR. GRANIERE: You're getting close. Okay. Okay. Other than net metering as being one of the concerns, what are some of the other concerns that they're saying to you as to why they may not want to do a solar application here?

MR. BROWN: With the rules on the rebate program, we've come a long way in a short amount of time. In the last two years, the state has shown a lot of commitment to renewable energy, and I thank the state. But they would like to see, maybe, some kind of a guarantee to the rebate program, some kind of prequalification, so where they could be sure that they were going to, you know, at least they are in line if, you know, something where they could put in an application, a preapplication to, basically, shore up the funds that would be administered to them. And if they meet all the obligations, do everything according to the rule, then they get their funds. Because that is one of the concerns, because as it is right now, they have to be out of pocket, paid for, and commissioned and signed off on and everything before they can even submit their application.

MR. GRANIERE: Thank you.

MR. BROWN: You're welcome.

MR. GRANIERE: Do you feel the same way?

Yes, go ahead, Mr. Lane.

MR. LANE: Tom Lane again. I think the main customers who walk away are sometimes our commercial customers, our business customers. The residential customers, I found a lot of them are concerned about the climate crisis and, you know, rising sea levels and want to do the responsible thing. But sometimes when I deal with business customers, it's a hard-core business decision. And I've seen several of them walk away, because the utilities, they feel like, are giving almost a slap in the face, like nowhere near what they should be getting for the power.

MR. GRANIERE: So would it be fair to say, Mr. Lane, that in your opinion that there are some businesses and commercial customers who do find the absence of net metering defined as receiving a retail rate as a deal breaker?

MR. LANE: Yes. A few residential customers look at it, and they look at a hard-core analysis of the price. But mainly it's business customers that look at it and look at what they're getting from a business rate, and then when they deal with their accountants, that starts to become a real negative for them.

MR. GRANIERE: Okay. Thank you.

MR. WALLACE: Hi. Wayne Wallace. I think it's very much an impact on a customer's decision, this net metering. A couple of customers that come to mind for me is one in

particular. He says, heck, if I can get a ten-year payback on this system, I feel I want to do it. I mean, he wants to do the right green, clean thing. He wants to do the right green footprint, helping his -- in fact, mainly his children and grandchildren he was thinking about. But, again, we need -- if you were to have -- if he was to present it to his accountant and know that he could not get net metering, his accountant would probably say just from a bean counting standpoint, say, don't do this.

The other big issue, which I understand is for tomorrow, is we've had a lot of commercial clients want to do the large systems, and then they find that the existing utility interconnection agreement that the Public Service Commission presently has in place is only 10 kW. And they want to do up to a 25 kW system to maximize the rebate funds by the Department of Environmental Protection.

Some of these utility interconnection agreements that these utilities do have are in excess of a hundred pages. And there are fees, and there's all kinds of hoops and obstacles, so there's a lot of reasons why they don't do it. But, again, net metering is definitely one of the obstacles that can sway them of not doing a renewable energy system.

MR. GRANIERE: Okay. Thank you, Mr. Wallace.

Susan, do you have anything you'd like to say before I ask Mr. Reedy here to give his presentation?

MS. SZARO: You know, just looking at -- Jennifer Szaro from OUC.

I just wanted to bring up one point, which is something that we are evaluating right now in our program. OUC is getting ready to launch -- we have net metering in place right now, but we are getting ready to launch a production incentive, which actually offers more than the retail rate for production of renewable energy.

One thing that we found in talking to manufacturers of photovoltaics and other system integrators was that the fact that 36 other states have net metering and we don't was a detractor from encouraging them to develop programs for manufacturing capability in Florida, not to mention our weak incentives, which are slowly improving. But for a large commercial customer it does have an overall impact.

And just as an aside, as a person who actually has a photovoltaic system on my own home -- thanks to Wayne Wallace down there -- you know, the cost of the meter that they had to install was about $150, I believe, the Smart Meter for dual metering. And just as someone in the utility business looking at the financials of that scenario for our own consideration, I probably feed back about five kilowatt hours per month and get the approximate equivalent of 20 cents a month or so of credit on my bill. That $150-meter, you're looking at about a 750-month payback on that meter.

So if you're looking at cross-subsidizing other customers, to me, that seems to be kind of counter-intuitive, given the cost of that extra equipment which is borne by the utility. Just one reason why we're kind of not going to go that way. We're thinking it's cheaper for us to just go ahead and install the regular meter.

On another issue, we see it as a value added incentive to our customers. So we view it as something that attracts our customers. We are a community-based utility. We want to make our customers happy and feel that they are valued, and that they're making a contribution to global climate change.

So we see it as something similar to any of our public education energy audits that we do for free for our customers. It's really not going to make that big of an impact financially either way for -- you know, I know this as a customer that has PV, it really doesn't make that big of a difference. I'd be getting, you know, 40 cents a month instead of 20. But I think what it does do is it sets the stage. It sets the tone for promoting renewables in Florida. I think that's really where the value is. I would think that that should be the focus of this. And we shouldn't be lagging behind the rest of the country on this, because we are losing potential jobs here in Florida.

MR. GRANIERE: Okay. Well, thank you very much for

your statement. But, just for the record, since you said that you were an Orlando Utility representative, but I heard that part of you was -- in that speech was the Orlando Utility representative and part of you was the customer. So I just wanted to let you know that I'm aware that there was -- part of it was not the Orlando Utility's --

MS. SZARO: Thank you.

MR. GRANIERE: -- official position.

MS. SZARO: Yes. Thank you.

MR. GRANIERE: Okay. Okay, Bob.

Oh, Susan, do you have anything? Okay.

MR. REEDY: I prefer to stand, but I don't see any portable microphones.

MR. GRANIERE: No, unfortunately. Sorry about that.

MR. REEDY: It's probably just as well. I was on a -- what's it called, a red-eye special from Denver last night, and got in at 2:00 a.m., so maybe I should sit.

And I put together some thoughts and assembled some pieces, which is what you will see, and it is probably a little more fragmented than I'd like to be with better preparation, but I come with this question, net metering, I come at it, and tomorrow interconnection, from over 34 years with the utilities here in Florida and with the industry. And only recently with the Solar Energy Center. So what you will see is an interesting -- I hope an interesting perspective of, I believe,

someone that at least has heard the issues, if not understand the issues from all sides.

So I was asked to sort of just go through some of these considerations, and I will do that. This is certainly information, the intent -- there's no way person can give information without revealing an opinion. So I went ahead and conceded that this is also -- there's some opinion, and I'll try an identify it when it's markedly my personal opinion.

I'll start out with what's driving -- why are we here today? You know, it's going to end up being a money discussion. And what's really going on, I have up there a Department of Energy slide. And I'm sorry I couldn't update it from the one we say yesterday in Denver at the DOE meeting that I was attending, because it would be '07, that line would be '07 instead of '05. But what I will tell you is that actually the price range for PV systems installed is actually lower than the band that they projected in '05, so that part of it looks good. It looks even more favorable.

And DOE very carefully just put a flat line for electric rates. They, after consideration, decided to show it as flat line. The result is the blue is this exponential increase. Why? Well, when the cost of -- if I can make this cursor behave -- when the cost of per kilowatt hour of installing and owning and maintaining your own PV system is less than the cost out of the outlet, what's going to happen?

It's going to take off, and it's going to take off exponentially.

I wanted to tweak that a little bit for Florida. And some of this is obviously -- let me identify some projections that would easily be challenged by our utility audience, and that would be -- this touch pad is just that, touchy. That would be the lines projecting future increases, the dotted green and the red dotted line projecting increases in electric rates.

The history is there, but those are considered opinions. They are not just guesses, but most people in the industry and most certainly the public believe that electric rates are going to increase. So with that said, look at some of these curves.

I know it's a busy slide, and I'm going to spend more time than I normally would because of the nature of the session. I just want to establish that there is something about to happen, and it's about to happen in the next three years, and it's going to be very dramatic. And that is that we are going to see, certainly on a time-of-day basis, the installed cost of photovoltaics amortize -- this is all -- this is all in, this is over the life of the system, 30 years, everything considered. Is going to cross over the time-of-day rate during the period of time that PV does generate and go below it in the near future.

So what I'm doing here, and we can talk about it as much as we'd like later, but I'm establishing that something very dramatic is going to happen economically very soon. But even today, if you will look at the crossing of the green and the blue line, the dotted green and the blue line, we see that systems are, you know, in about two years going to cross over, one to two years cross over the time-of-day rate. Notice, also, the brown line, which is the improvement reduction in cost because of commercial large scale installation. So it's roughly 15 to 25 percent less.

So the context for my remarks and for really our whole discussion -- and this is a very dangerous thing for an engineer to present, to say in a room full of -- not full, but with a fair number of attorneys and legal knowledge, is that this Florida law that sits back there and talks about purchases of renewable energy, 366.091, the language in there is that it's to be purchased -- or the purchase from the producer is to be full avoided cost. And, by the way, when I say producer, even though I think we all realize that when this was passed that it was really not specifically directed to small PV, it did not exclude PV, that I can tell. So it talks about renewable energy and says that it should command full avoided cost, and then we get to have a lot of discussion --

(Tape change.)

-- and it applies to all utilities, municipals,

municipalities, cooperatives over 2,000 gigawatt hours, as well as IOUs. Capacity credit is to be given if it's warranted. And then, of course, that's a technical discussion, and it's a long discussion, granted. But it is to be given if warranted.

And cost recovery is allowed for administration and other costs. It requires that the producer, in this case it would be the owner of the PV system, pays any interconnection cost. Now, that's the interconnection cost. I'll talk about what that means.

And when I say PV and producer all long, I know this is for all forms of -- this particular statute applies to all forms of renewable energy. But we really are, I think, largely shorthand when we're talking PV.

So let me raise a few issues and try to get a little perspective on them. Certainly residential rates contain more than energy. It's embedded in there, and the residential rate class is a well-behaved rate class. I mean, you know, except for a few -- I think they call them McMansions or something like that, very large homes. And, basically, the homes kind of fall into a very large well-behaved group of customers. And so naturally, forever, as utilities, we roll together all the costs that have to do with -- there's fixed costs and capacity and other things, and energy, and we attach it to the -- largely to the variable cost per kilowatt hour. There are some fixed charges and other things. But, basically, we recover it

through the variable rate.

So embedded in that, and it's something that's always brought in discussions of net metering is, oh, yeah, you know, there's more in that rate than just the energy. Of course there is, and there they are. And there's other things, too.

There are expectations of producers that they say the same thing, of course. There is more than energy in what they produce. PV systems are very reliable capacity, very predictable capacity and occur or generate most at the peak hours, actually the super peak hours. So there is system support value for voltage instability and they expect to be rewarded for that. And they expect to earn a return on their investment, just as any other investor has. So these are both acknowledging that there's more to -- whether you are generating a kilowatt hour and shipping it out to the utility or whether the utility is shipping the kilowatt hour to the homeowner, both have more than energy embedded in it, even though it's billed as energy.

Let's talk about capacity. There's a perception that, oh, well, we're cloudy in Florida, so our PV potential is lower. Our PV potential on an annual basis -- we've got studies, and I can start displaying them -- is about 85 to 87 percent of the best in the world, which is the southwest area, down in Arizona and in that area, mostly because of moisture, not clouds so much as just haze, you know, moisture.

But, in terms of reliability, I had responsibility for simply cycle and combined cycle gas turbines, coal-fired units, there's a lot of parts in those machines, and I also now have learned to appreciate greatly the reliability of PV. So it is absolutely predictable. You give me the weather, you give me the location and the system parameters, and I can tell you how much it's going to produce, which is interesting when you start talking about what we can do with these systems when they are aggregated. It is absolutely on the super peak, and that's very valuable energy, and we'll talk more about that a lot, I'm sure.

And a very valuable capacity as well as energy. Even with clouds, even on a cloudy day, you can get about 30 or 40 percent out of a system, even if it's what we would call a very cloudy day. And only a really heavy, you know, cloud shuts it out completely. But that's local, and that's what I used to call in the control center as a peak shaver. So, hey, you know, it doesn't produce during a thunderstorm in that local area, but then, again, the load just dropped tremendously.

Also, when changes occur in the output, those changes are smooth. And as a system operator or former system operator, I appreciate that. Having a unit trip, it's always in the middle of the night, we say. But, actually, it's always in the worst part of the day, is quite an upset to the system. So having systems that may shut down for some reason or

another, individually small ones, is wonderful compared to the transition -- with a smooth transition that you get. You're just losing a few percent at most, even in a thunderstorm.

Okay. Another one we hear about a lot and we need to discuss and understand is stranded cost. You know, there's this thing that, hey, if you're generating all of your energy, and I'm billing you by the kilowatt hour, and I haven't changed my rate structure to accommodate for the fact that you're not buying any -- you know, a net zero energy home is a utility's worst nightmare if you're billing on energy, because there's no revenue. So we recognize that that comes up a lot, and it often comes up with like an entire city leaving a wholesale contract, or something, or leaving -- becoming a municipality, and there's a big chunk of disruption in the revenue stream and the plans.

But here we're talking about small increments, so there is no big disruption in the revenue stream. And as long as we're building new plants and new T&D facilities, I think there's a fair argument that there is no stranded cost issue. How could there be if you're still building new plant and T&D. And when there is -- and there have been some countries with some pretty good penetration of distributed generation, particularly Germany, and others in Europe, and they still have a load growth and still need the new facilities.

Another one we will be talking a lot about is the --

another issue is the standby debate. Most utilities in Florida are winter peaking and have a needle peak or they sequentially peak winter to summer. But there's a concern if it's 6:00 a.m. on a cold winter morning and the generation capacity is wide open and the T&D system is straining, your PV system -- I don't think anybody here in the room that sells them would argue that it's running unless they have batteries. And that's another subject. But, generally, they don't perform at that time.

Okay. Well, you know, we've already -- we're dealing with this. We're dealing with a much, much, much bigger problem right now, and that's strip heat, electric resistance heating. You know, you'll have 10 to 20 kW sometimes. And we, as utilities, have worked all this out. And that's kind of embedded in the rate structure is that that's okay. I'm not saying it's okay, but, you know what I mean, it's accepted because it's spread out over the whole rate base.

So I would submit that those are the far bigger problems than a PV system that doesn't produce at 6:00 a.m. on a cold winter morning in terms of standby. And if we deal with one, you know, if we deal with that on that basis, then we really have a bigger problem, I guess, is what I'm saying.

Also, we find that most people, and I think the industry that is represented here today would agree that most people that are putting this kind of investment in green generation are also the type of homeowner that will have a very

efficient heat pump. And I'm sure that if they were posed with this problem would probably even voluntarily disable some stages or all -- some stages of strip heat. I think maybe leaving 5kW, or something. So we will talk about standby, I'm sure.

Another thing we're going to have a lot of discussion about is that PV is not dispatchable in the classic utility sense. You can't punch a button and bring it on. Well, it's not really apples-to-apples. Utilities often will engage in long-term future strips or purchases of capacity and energy in wholesale energy contracts, and that's really the way this has to be viewed. You know when it's going to produce -- and we're talking in aggregate now -- and you know what it's going to produce. It's not intended to be dispatchable. It's intended much like a long-term power purchase contract with a neighboring utility, a very small utility.

Equity issues really underlie everything we do, I guess, and anything to do with rates and anything to do with incentives and rules that affect the money. And one of the equity issues that I've often raised is, well, wait a minute, you know, this rate class subsidy thing, not all homeowners can afford it. They can't raise the capital. Maybe they have shading, maybe they can't -- don't have a -- maybe they're in a condominium and they're on the second floor or something, and they can't do it. So maybe it's not fair.

And we all accept, you know, that generally the whole idea is that rate classes should stand alone without subsidy. But that's a two-way street. I think it's a fair discussion at the very least. And from my new position, I would say it's a pretty strong argument that net metering -- you know, PV without net metering, if it's not rewarded more appropriately is actually -- it's subsidizing the other direction. And we can talk about that, and I've got some examples coming up here.

So, you know, this whole business is really all about equality and understanding how the technology works and understanding how it behaves economically, and then matching that up with our rate and our rules. And that leads me to say that, you know, ratemaking changes. Rulemaking has to change with technology and social change. And if the cost of PV going from something like $25 a kilowatt hour to today's 28 cents a kilowatt hour is not a change, I don't know what is. So I think we are talking about a change in paradigm right now, and this is what the process is all about.

But I have to say, you know, for this same reason -- I mean, as a long-term participant as a utility person, you know, the capital investments are huge, and we need certainty and we need to know what the deal is. So that scary curve really is pretty scary from a utility, if you start thinking, wow, I can see a time -- if my business is long-term planning and I'm sitting here saying, I see a time when a lot of homes

could be net zero, you know, zero energy, something is going to have to address that, because we still have to build those power plants and facilities.

I want to quickly move on and to say one other observation, of course, is that HVAC, H-V-A-C, the blue wedge there is the driver in Florida for air conditioning, and that leads me to the time-of-day discussion. It really does matter what time it is. And several years in wholesale energy marketing, several years as an operator of a control center, we all understand the time of day, and it can vary widely. And utilities generally have -- have actually acknowledged and filed that. That's embedded in their time-of-day rate, and it's usually like a three-to-one ratio between off-peak and on-peak. But that ratio varies, of course, and needs a lot of discussion, but it's still a long way from the average annual cost of generation, or certainly the avoided cost. I mean -- excuse me, the as-available cost.

And in a pure definition, I believe, and this is an opinion, that full avoided cost is exactly that. It's what you avoid but for that generation. And if you're a utility, you're in the hourly markets. And if you don't have to buy because you have enough generation, and you have some excess, you sell it. So that hourly market cost is arguably a good measure of full avoided cost. And the trouble is, it goes all over the place. At night it's very low, sometimes on ultra-peak or

super-peak, it could be, you know, ten-to-one over the average annual energy cost. So it's so complex. And we've actually sort of made the -- through the time-of-day ratemaking process, it kind of said, okay, if you're selling energy during these hours, this is the price of it versus these hours. You know, it's embedded in there. If you work that all out, you know, net metering gets pretty close to it.

When I say net metering, I'm not quibbling over -- I'm saying net, you know, it's the net. You add what goes this way and subtract what -- or subtract what goes the other way. That's net. And it approximates the full avoided cost, hourly full avoided cost over a large group of people, of customers.

And just a few more words, then, about -- I've been talking -- I've been alluding to the values of PV, and we often, we talk about the energy itself and the time of day it was generated. We talk about losses and reduction of losses on the T&D system. We talk about the capacity, having to build the generating plant and the transformers and the transmission lines. Those are conventionally brought forth in any discussion of PV or distributed -- all distributed generation, actually.

But the full benefits are often ignored. They're complex, and they are hard to measure and they are often ignored. Here's a few of them here. The predictability of it. As an energy marketer, that's worth a lot. You know, knowing

what the market is going to be and what you have is -- that's how you make money. The capacity, you know, can be bundled up in different ways if you have a large aggregated amount.

Very important as a system operator is voltage support and reactor supply. And my last gig was with Georgia Transmission Corporation up in Atlanta, and the Southern Company in Georgia has a real problem with voltage support. That's a phenomena -- to throw an acronym out, it's fault induced delayed voltage recovery, FIDVR. And that really -- a lot of money being spent, hundreds of millions of dollars to support the voltage during those events.

Peak shifting, with the future generations of -- not future, systems that are being designed today, PV systems have large batteries for overnight type use. But one of the most interesting things is a very small battery that doesn't cost very much and is integrated into a smart controller and actually allows you to support the grid like during faults or during brownouts or just system events, and that's worth a lot to an operating utility.

And then, finally, the renewable energy credits. Now, I don't know who's going to own them. I mean, that's another discussion, but they are quite valuable today.

A little hokey statement here. Remember the old song, "Give Peace a Chance." Really what I'm trying to say is it's a basic statement of equality. You know, if it's equal,

it's equal. You know, whatever the same -- whatever generator has the same size and characteristics, then it should apply, the rules and the way it behaves. And size actually does occur with aggregation. If you have several thousand PV systems, then you're talking about a few megawatts of generation. Excuse me. And the characteristics that are all in it, in the PV systems themselves.

Let me show you a utility. Here's a diagram of a utility. I'll play with this cursor again and see if I can -- but, you know, you have a -- whoops. I'm not going to touch the cursor. I'm going to point. But work your way through those pieces. You can find things you recognize. Your load, the red box. You have a tie, an inter-tie with neighboring utilities. You have independent generators, and you have your own aggregate system generation model there. You have transmission.

Here's a smaller utility. It looks a lot the same, behaves a lot the same. We can go down the road a little ways and really help out the electric utility by taking our plug-in hybrids, which are very great market opportunity for utilities, because it's good baseload energy in the middle of the night, typically. The flip side of that is that with that plugged in -- that car plugged into the garage into your control system, you can really help the utility out with a lot of power. You know, instead of two or five kW, you could get 20

or 30, depending on the limitations of the system. So that's a future world that's not so far out. There's a lot of work being done in that area right now.

But, again, you see the elements are the same. You've got a neighbor, you've got a tie, an inter-tie. You have meter reading. You have characteristics that -- and an agreement. And then aggregation puts it all together and makes the small units equal one large unit in a given control area.

And if that's not -- if you don't realize that that's important, I had responsibility at Georgia Transmission to review the blackout of '03, the midwest and northeast blackout. I learned a lot. And, you know, I review things; steady state, things are pretty complicated as they are. When you have a disturbance occur and everything starts going crazy, it gets really wild.

The basic thing we always look for is that generation has to equal load in any area. When it doesn't, bad things happen. The frequency goes up or goes down. You know, we recognize that the eastern interconnection is the largest -- we call it the world's biggest machine. It's this huge billion horsepower machine running at 3,600 RPM. That's one way to look at it. But it's very complex. One of the things that make it behave well is called the H constant -- just because I think you always ought to have a little technical talk in anything -- just mention that this H constant is a

characterization of how stable the system is. It's a tend to keep doing what it's doing. It's like inertia. Think of it as inertia. And I have a picture here of a hydro unit, because they often have large H constants.

One of the things about PV with those little batteries that I talked about, as well as many other forms of distributed generation, is that they provide a very stable and effectively equivalent large H constant. And I wanted to show you something very real here. I won't read it. This is about the blackout, you know. This really happened. I mean, this is where I really need my pointer. I'm really going to try and risk the cursor here.

This is the period of time, and when I looked into this at the Southern Company and Georgia Transmission, we were all happy, because we did not black out. And we were all proud of ourselves, and we said, wow, you know, we didn't go down. Our transmission is strong and we have good practices, et cetera. And you start looking into it. And you start looking in -- you blow up that period of time right after the event happened. And what you see in that red V building up is what's called an undamped oscillation.

This is a chart of the frequency of the eastern interconnect, and this is the same everywhere. It was the same frequency in Georgia. It was the same frequency in Miami. This is what it did. And you'll notice that it was blowing up.

It was getting larger. And at time T plus 12.5 seconds it stopped and started -- it came back down again. And the only thing that -- what happened then was that the split occurred. The blackout occurred up in Ohio and New York. And a large block of load and generation separated from the rest of us and we recovered.

So because our transmission was not strong -- it's the exact opposite of what we said. Because the transmission did break up, we survived and we did not have the entire Eastern United States blacked out. So we missed that, and we dodged that bullet, as they say, and it's a little known fact, even among specialists that look at this, is that we came very close. And I'm taking this length just to say that the answer to this isn't stronger transmission so simply. One of the best responses is distributed generation. And so that's a value.

And that leads me all back to say that's an underappreciated value. And if you don't get that in electrical terms, this is the same phenomena in the mechanical world that happened in the Tacoma Narrows Bridge near Seattle back in the '40s, I believe, or '50s, when a stability problem got started, and it came apart. A very famous video clip that all engineering students have to see.

So it's a swing squasher and a fiddler fighter (phonetic). That's what DG is. It's hard to measure, but it's very real. It's got a very high equivalent capacity factor.

It's very predictable. It can be modeled and bring a premium for any type of marketing activity.

And I want to kind of close out with one more thought, and I've gone through this both trying to reveal my utility roots and my new understanding of PV systems, and it just strikes me that if this is -- if these things are true, I believe they're true, you know, they warrant full compensation to the owner. But then again, the utility can be the owner. If the utility had an easement and owned systems on individual homes' roofs, then, absolutely, all those aspects for reliability and economics and conservation, all those, you know, distribution, voltage control, losses, all those things qualify that system into the rate base. So it's just a -- you know, it's a classic two-way street thing. And as we've heard already, you know, 36 states, it's one of the more well-studied issues in the utility industry today.

And that's kind of where I wanted to end it. And I appreciate the audience and hope that that kind of sets a tone for things to talk about. And there's plenty to talk about.

MR. GRANIERE: Bob Graniere speaking.

Thank you, Robert, for your presentation. And I think there's a lot of food for thought in that particular presentation, so what I'm going to suggest is that we take a ten-minute break here and regroup. Then regroup and see if there is anybody who would like to respond to Mr. Reedy's

points that were made.

MS. CLARK: Bob, I think there are some questions and clarifications that we might like. One thing I would point out, it seems to me that everything is geared toward photovoltaics. And is that the direction of -- any consideration of net metering is that it be targeted to that technology? That's certainly one question we have. But, yes, by all means, let's take a break. Thank you.

(Recess.)

MR. HARRIS: One thing before Bob gets going. I realized we neglected to put together a sign-in sheet, so I started a legal pad with names and organizations and contact information, and it's circulated in the back. And it should be somewhere, and we'll find it. And I just wanted to encourage everyone to get your name on the list. It will be a legal pad. We'll have it on one of these tables whenever I can find out where it is.

SPEAKER: (Inaudible.)

MR. HARRIS: Okay. Great. It's in the back corner. So I would encourage everyone who is here to get your name written down on that so that we have sort of a list of participants. And, also, it will help the court reporter if you all do speak to know how to spell your name and everything.

MR. GRANIERE: Okay. We are opening back up again. It's about 11:30. How about breaking at 12:30 for lunch, is

that a good idea?

SPEAKER: Yeah.

MR. GRANIERE: Great. Done. Okay.

SPEAKER: I'm not used to being able to vote.

MR. GRANIERE: Oh, yeah. Come on. You know, I'm easy. Because I don't eat lunch, so that's what makes it easy.

So, all right. Now, Susan -- this is Bob Graniere again -- to get back to the question that you had when we left, is this only for PV? It seems that the only people who showed up were PV people. I'm frankly quite surprised that other renewables didn't come. But I can only conclude that if they don't come, they're not interested, and I think that's fair. You know, if you don't come, and you don't want to talk, then I'm going to have to assume that you're not interested in this part of it. And that will just be what I will note, absence of other renewables than PV. And we should know that, and that's a piece of information.

So that will obviously have some impact on another one of your questions, which was what is the right size for this net metering and things along those lines. And, also, it would have an impact on what is the definition of a net-metered facility. Will it be only a PV facility or will it be a much broader definition, which would be distributed generation. And then we'd have to talk about where the interconnection is actually made, which we'd get to tomorrow.

So we just need to, you know, keep that in mind. But right now it's not -- it's not the staff's intent to limit it to PV, but if that's the will of the renewables, that they're not interested, well, then they're not interested.

MS. CLARK: They haven't indicated a need for it, then.

MR. GRANIERE: Yeah, yeah. You know I'm not going to -- you know, there's no sense in putting up a set of rules and put in a lot of unnecessary complications for a group of people who have no interest in it. I mean, it's useless. So I don't want to do that, or recommend it, at least. Okay. And so I hope I answered your two questions. Okay.

MS. CLARK: If I might, Bob -- this is Susan Clark again -- ask another question. As I heard Michael Brown speaking, he indicated for at least those customers or people he is speaking for and from his perspective, when he speaks about the need for net metering, he's talking about people who have installed these facilities to offset their own needs, to meet their own generation needs and not for the purpose of providing energy back into the grid primarily.

And I'm wondering if that is also sort of the staff's take on that? Because when you mentioned distributed generation, I guess the question arises are we talking about customers who are doing it to offset taking power from the grid, or are we talking about people who are in the business of

putting power on the grid?

MR. GRANIERE: Bob Graniere again.

Susan, like I said, I think it's the staff's position right now that we have everything open and that it is distributed generation, at least there's a working hypothesis right now.

One of the reasons that we're looking at that is that if you'll go to this part of this here book, if you went to the back to net metering information, you would see that New Jersey and, for that matter, Colorado, are talking about a ceiling of 2 megawatts, and something really large for both their interconnection and net metering. They, of course, have a very broad definition of what it is, and I would think it's fair to characterize it as treating renewables as distributed generation, and then placing a limit on the size of distributed generation.

We also know that, at least from the facts, is that FERC has given its definition of a small power producer. They have given their definition of that, and it's a 20-megawatt facility. That's what they've called a small power producer in their Order 890. So they have done that. Now, that's kind of a large facility for net metering, I would think. I mean, that's just my gut reaction. But we do know that, you know, there has been work along the lines as what characterizes a small facility.

So, you know, I just don't want to say right now that it's the staff's intent not to get larger than, say, ten kilowatts. But I think it's an issue that we need to talk about and talk about in a real sense, in a real give and take, and not simply just the -- you know, it can only be 10 kW. So I just think it's something that we really do need to talk about.

And one of the concerns that I am sitting up with and sitting up with is -- and I think this is the one that would be relevant here and right on target would be what happens to these solar arrays that are coming out? They're clearly larger than 10 kW, and my understanding is that FP&L Energy has announced a 250 kW array out there in Sarasota, and there's another company that I'm aware of that -- and I don't know if it's the same company as FP&L Energy, but it had a different name on its self-certificate qualifying application. And if it's not the same, then there would be another 225 kW application in the same town, Sarasota. So if that is true, then we have -- so if there's one that's 250, if there's two, then it is almost like 475. And so what do we do with those? Do they get net metered or do they get something else? And it's something we need to talk about, you know, and find out about.

And that even just applies for -- even if this were to be restricted only to PV, we would still have to deal with

that problem, or that issue. It's not necessarily a problem, but we would still have to deal with it in some way, and start thinking about it. So it's not like just being here and PV means we'd never have to deal with something that may can be considered quite large. Okay. So just from that point of view.

For example, I mean, this is just a possibility. I'm not saying that this would happen, but let's say that someone had decided that the ceiling is 500 kW. Well, then these solar arrays would get net metered if there was a net metering law, right? So we've got to talk about that. But it's not like they don't exist, they're out there. People are saying they are going to build them. So we've got to see what we're going to do with them.

MS. HARLOW: Can I add something briefly to that, Bob?

I thought Mr. Wallace made an interesting point earlier about the state rebate programs and businesses looking at those rebates, and that for them to take maximum advantage of -- jump in, Mr. Wallace, if I misunderstood you. But for businesses to take maximum advantage of that rebate, we'd be talking about a 25 kW system. The Commission's current rule on interconnection of a small PV that mentions net metering goes up to 10 kW. And so that may be something we want to discuss, not necessarily today, but perhaps tomorrow, that we would look

into whether it was feasibly possible to make the Commission's rules consistent with the new state rebates on those 25 kW systems.

MR. WALLACE: That is correct. In fact, if I may add -- Wayne Wallace. If I made add, many commercial customers that want to be -- in fact, they tell us they want to be responsible, they want to do the right thing, they want to be green, they want to leave a clean, green corporate footprint, they want to do systems larger than 25 kW. And, you know, at minimum I agree with that statement there, the utility -- or net metering should be at least up to 25 kW to fall in line with the state department of -- well, DEP rebate program of the 25 kW. But we certainly would like to see this net metering be, you know, up to one to two -- one or two megawatts.

MR. GRANIERE: Well, Mr. Wallace, I can agree. I'm not surprised, you know. But I guess that is something we have to talk about.

Bob.

MR. REEDY: Bob Reedy. I'd like to make a comment, too. It seems that whatever is resolved, it needs to be based on something that is an agreeable criteria. I mean, is it a technical problem? Is it disruptive to the rate -- to the whole ratemaking process or just to say, well, 10 kW because that's a nice number is a little bit problematic because systems keep becoming more efficient and larger. And, you

know, 10 kW was outrageously large just five years ago, but it's quite common in states that are active in this area to see 25 kW, 20 and 25 kW, even residential systems. Mansions, granted, large homes, but still the criteria. I think that when we end up with something, we should have a reason that we are saying that stands up objectively, technically, and financially.

MR. GRANIERE: Bob Graniere.

I'm comfortable saying that I think the staff says that we should not just pick a number out of the blue and say that this is the right number. And, yes, a lot of our questions here are exactly to that issue of, you know, what are the limitations, if any? Why? You know, how are they important and that we need to address those things. And so I do want to get to -- so before we get to these questions, I just have one more question. And, Susan, it's not of you or the utilities, it's of the solar industry. And here is my question.

My question to the solar industry is why is it still so expensive to put in solar? I mean, we've been studying this stuff for 30 years and doing this stuff for a long, long time. Why is it still so expensive to put this stuff in, especially -- would it be fair to say that maybe the efficiency in the solar is finally good enough where we can turn our attention to reducing its cost as opposed to improving its

efficiency? I mean, I'm just, you know --

SPEAKER: How much time --

MR. GRANIERE: I'm just kind of confused. I mean, I just wonder, you know, normally I hear, and we all hear that it's just around the corner. Well, that corner has been out there for 30 years. It must one corner, that's all I've got to say, coming around it. And I'm just kind of wondering why it has taken so long.

I'm not the only one who thinks this. These guys here who did this here news release, they say exactly the same thing. But I've been asked this question before that, so I don't feel bad. But they're asking exactly the same thing, why has this been out here for 30 years and the cost just ain't coming down?

MR. REEDY: Bob Reedy. If I may respond. And I was going to say how much -- how many days do we have for this discussion? There's probably nothing more central to what we do today at FSEC than to try and address that very question.

Let me go up to the DOE. It's true, there has certainly been expectation. We are, by nature, as scientists and engineers, we're optimistic people. We think that we can solve things. And thank goodness we're in that business, because if we were pessimistic we would have never tried. But it has happened, so we don't have to -- we don't have to ask when will it happen before.

This curve that you see of system price, that yellow band that comes down, was way -- well, it's exponential. If you go back past 1990, it goes way up, extremely high prices. I mean, literally space type stuff. I mean, that's the only real market and very special off-grid, if we had no other way to get electric power. So that question is frustrating because it's really a moot point. We are on the -- we're on this curve right now. And like I said, this is '05, and we just got an updated one, which actually lowered it a little more.

And the tipping point, an overused phrase, but has been the price of alternative -- I call alternative energy as gas and oil and coal, to me that's alternative energy. And that energy has exponentially bumped up in the last few years. And so --

(Tape change.)

-- and that's coming on-line today, just this year quite a bit. And so a lot of people that really do understand manufacturing and really do understand the whole process involved have worked on this slide right here. And so it is -- this time, believe us, it is going to come down.

There are other things that happen, too, that as utilities, we do things in a grand scale. We build distribution systems and hang transformers and read meters and everything is done, as manufacturers. Manufacturers do things in a grand scale. And all of that means the volume lowers the

per unit price.

But the one thing that is tough right now with residential PV especially is the whole process of getting it out and getting it installed. And so a lot of work is going on right now, some of these gentlemen right here are involved in that, and the industry as a whole is looking at it, ways to bring it down, and so that the net product becomes a rather boring appliance that is installed in every home that gets built.

I know that wasn't an answer, but it was --

MR. GRANIERE: Well, you're absolutely right.

MR. REEDY: But I had -- you know I had to say it.

MR. GRANIERE: You know, I guess I could just ask the following question, is that what I hear so often is that this is a -- well, I hear economies of scale, which being an economist, I don't really think that's the case. But what I think is the boast of you there from what I hear from all this stuff is that the industry is in its declining average cost part of its curve, which just means that if you produce more, the average cost goes down. That's just because you just produce more. But every time the industry produces more, it seems like the price goes up, and that to me is just counter-intuitive.

MR. REEDY: Bob Reedy. It's not an interlastic or elastic curve. You're the economist. But, in other words,

when there are shortages out there, that's the type of behavior you get. And until it has enough financial and mass to where these things, you know, supply and demand can go to work, you're going to have those anomalies. We're getting through that. I mean, that's really -- let's look at that curve and see that we had a huge shortage if you go back about '05, '04/'05, there was a tremendous shortfall in silicon, which destroys that behavior that we like. And if you look, there's a slight little bump. I'm afraid to touch this cursor pad, but there is a slight little bump there where that band sort of kicks up a little bit.

Well, that wasn't -- I mean, that was a huge shortfall and yet we pushed through. And how did we push through is we built new plant. Because, fundamentally, the long-term picture is, well, if I build these things they last 30 years or more and there's no fuel and there's no maintenance. It's pretty compelling when you start doing risk analysis in the long term. So investors started saying, wait a minute, this is the place to be, and that's what happened.

MR. WALLACE: I would also like to add a few things, if I may. Wayne Wallace.

When the solar industry can reach what I like to say mainstream America, I believe the cost on solar thermal, solar PV will dramatically decrease. You know, I'll give you an example. I just had a recent homeowner, you know, take a look

at the federal tax credit, the state rebate, savings on the utility bill. They wanted to do a solar thermal system, solar hot water for their home, showers, laundry, et cetera. Well, they had natural gas in their community, and the natural gas, a small municipal utility, basically, put in a free water heater for them. So they looked at this free initial impact of the cost and said, hey, you know, let's go with this natural gas water heater. It's free.

The solar water heater, the initial expense, you know, the copper, the glass, the installation, the labor, there's not a whole lot of people doing it. In fact, just getting the word out on the federal tax credit, a lot of people aren't aware of that. Getting the word out on the state of Florida rebate, a lot of people aren't aware of that. And the utilities, you know, have an audience of millions potentially, and they communicate with their customers every month. The solar industry has a hard time getting that word out. And, basically, it's kind of like a David and Goliath kind of a situation. We're very, very small, and we have a hard time getting that word out.

So every little obstacle that we come up against -- one of them just recently was putting solar in homes where homeowners' associations can say, hey, you can't put solar in that home. I mean, we won that battle. We also were able to put in some more systems for people to, you know, lower their

electric bill, save energy, reduce the carbons, make a greener footprint. And now here we are, you know, I feel like battling to raise the net metering standard to do more solar. So if we can do more solar and we, you know, overcome these obstacles, the price can come down.

MR. LANE: I'd like to make a couple of comments to directly address your question. One is, you know, if you look at an automobile today compared to an automobile 10, 15 years ago, if the cost had gone up a little bit, you would look at all the new benefits that might be in a car and all the amenities that are in there now.

Solar electric systems not long ago, the panels were typically warranted 10 years. All the ones we use now have a 25-year warranty on them. So I would say when you've gone from a 10-year warranty to a 25-year warranty, if the cost remains the same, then it's dramatically dropped. And most of the balance of systems that we use, like the inverters, they were typically like a five-year warranty are now typically a ten-year warranty. So when you look at those sort of aspects, the cost has dropped.

Now, I would think if you look at one particular example would be the German example. About seven years ago, the Green party in Germany, they have a three-party system there, combined with the Social Democrats to put in what are called feed-in tariffs, which guaranteed commercial and

residential customers five to ten times, in some cases, most times five to seven what they were being charged. A guarantee for 25 years based on a limited time period of five years buying into that.

And I was in Germany two years ago attending a conference when these renewable credits were coming up to being. It was interesting, the party that fought that was fighting the hardest to keep it in and keep it going for another five years, because they had created over 170,000 high-paying jobs in Germany because they had initiated this program. And the Germans that were on the latitude of central Canada have 70 percent less power than us.

So when they looked at -- you know, they come to Florida, for instance, the German trade conference came to Orlando about, I think it was four months ago, and there was a meeting with their industry association and the Florida Commerce, and they were just stunned that there wasn't more solar in this state. And they often said if the opportunity, if it gets better, you know, with the utilities offering more, many of them were talking about opening manufacturing plants in Florida or, you know, creating manufacturing plants here in the state.

And, you know, two years ago they created another five-year buy-in program what are called feed-in tariffs, which Oregon is getting ready to do now. And most people that look

at this look at how incredibly many high-paying permanent jobs it creates. Typically, if you look at it versus just strict utility company of a nuclear power plant or a coal plant, the ratio of job creation is like 60-to-1.

So I think that's a big benefit in bringing the cost down from the standpoint of society, what's a real cost. But if you look at a technological breakthrough in semi-conductor technology, we are pretty much fairly close to reaching the limits there until there's another breakthrough in the technology itself, which would probably be on the level of nanoconductors at the microscopic level of intercepting photoelectric energy.

MR. GRANIERE: Thank you, Mr. Lane.

Okay. So let me see if I can summarize. Would it be fair to say that the position is that there is no technological breakthrough on the horizon that will reduce the cost, is that fair?

MR. LANE: I personally don't believe there is going to be, except in that, if we train people to put them in faster, if we get better training and more people putting them in. A lot of the raw materials that are used in solar cells outside the cells themselves keep going up, like aluminum keeps going up in price, glass keeps going up in price. But, here again, I would mention the warranties are now 25 years rather than ten. The balance of systems is typically ten rather than

five. And I don't think we're going to have a dramatic reduction in cost until there is another breakthrough in the interception of the technology itself.

MR. REEDY: Bob Reedy.

I'd like to respond, and it's really not differing with Tom, it's just sort of elaborating a little further. And he said unless there's a breakthrough, and there are a number of things on the near term horizon that will dramatically improve the efficiency, which, therefore, reduces cost and also improves the density and the -- for the same installation, labor and all of putting in a 1-kW system, we can put in a 5-kW system. Such things as concentrating systems that do more, produce higher power.

So I believe there are -- I believe the statement that Tom Lane made is true, but I believe that it -- a little different twist, that there's more -- there's more near-term cost reduction than most folks realize is coming up. So it's a good picture, I actually think in that regard.

MR. GRANIERE: Okay. Bob Graniere again.

I guess I'm a little confused. Did you just say that improving the efficiency is going to lower its cost, or did you say improving the efficiency is going to increase its output and the increased output will lower its --

MR. REEDY: I appreciate the confusion I caused there. I'm sorry. It's the latter. When you increase

efficiency, in other words, kW per square meter, a lot of things happen. You're using less aluminum in the mounting and less labor per unit of output, per kW of output. And you are able to use more of the -- put more on the roof, so you can get better usage of the transformers and facilities. So there's the derivative effects that occur from improved efficiency that I was really referring to.

And some of those efficiency breakthroughs are quite dramatic programs that are being -- they are in the prototype phase now. They are not commercial, but they're -- no one sees any great pitfall to them. And we've moved beyond the mysteries of the solar cell, I guess is the way to put it. And it is really becoming more of a manufacturing problem and a refinement of the design for these new technologies that are referred to.

MR. WALLACE: I'd like to add something, if I may. Wayne Wallace.

Solar energy certainly needs to have some subsidies to get costs down. If we look at what they're doing in Germany, if we look at what they're doing in Japan, they're basically taking the lead on these high-paying jobs. They are subsidizing this and, you know, they're not arguing over net metering. They're basically, as Tom Lane mentioned, they're paying five to ten times the amount to people that are independent power producers. The whole real issue is really

clean energy. It's not what is less money, I think. Solar can be less money if we have some subsidies. Our country has subsidized coal and gas for decades. And if we can continue knocking down barriers to further the cause of solar energy and help subsidize solar energy, we can leave a greener, cleaner footprint and leave this place cleaner than we find it.

So it's just a -- it's a goodwill thing to do. And with the right policies and subsidies, solar energy can save homeowners and Floridians, you know, millions of dollars, as I mentioned earlier in this Florida Solar Energy Center study that they did.

MR. GRANIERE: Okay.

MR. BROWN: Excuse me, Bob. Michael Brown here. Yes, I just -- I agree with what Wayne and Tom Lane have said, also. But to get back to why the cost is so high right now, it's like what Bob Reedy had shown us on the graph, that what happened is when we came up on the shortage of silicone, also the whole industry was retooling and building new factories. And almost every manufacturer went into retooling and building a newer infrastructure so that they could supply the demand. Because there is a very high demand throughout the world for this right now. And as Wayne and Tom had said, that once we get some subsidies in the states and also in Florida, then, of course, the cost will come down just because of the subsidy.

But your main question is why is the actual product

high-priced. And it's because of the retooling, and, also, there's been a standard set in the industry as to what level of quality there is going to be in the product that is put out. And the research and the development in new product has not stopped, and that goes back again to what Bob was talking to about new cells that are coming out. There are multi-junction cells, there are concentrator cells, there are all kinds of new technologies coming out. And when those come out initially, the research and development is going to be put into the cost of that. And that's what the retooling has done with the rest of the cells -- I mean, the rest of the modules.

Manufacturers, like I said, across the board, all the major players have built new facilities, and that cost goes into the product right now. SMA America, which is a German company, but that's their office in America, they're bringing their costs down. Almost all the inverter manufacturers are bringing their costs down. There are some higher level inverters that the cost is still high. Those are specialty items. When we talked about peak shaving earlier, there are actually products on the market right now that will allow you to do that remotely, and they are battery inverter systems.

But, if you're looking at your efficiency on an economic basis rather than on an energy per square meter basis, then you can still -- you can go out into the market now, if you are willing to buy a module that doesn't make the same

power as the module right next to it. It looks exactly the same, if you're willing to cover more area, you can get a better deal.

But the industry standard is to continue on the research and development and to continue until we get something that you could power an entire house and use less than 1,000 square feet, because a 10 kilowatt system right now, basically, equals 1,000 square feet. It's coming down. Now, if we are talking about -- we have some hybrid modules out, you know, and some other manufacturers that are coming out with some higher efficiency modules which takes less space and that footprint that you're actually going to have to cover with the actual modules is shrinking. And that is what we're paying for right now.

We're paying for getting the system into a real efficient footprint so that it can be something that you could put -- if a customer wants to meet their home's demands, it will be easier for them to do that, rather than being restricted by how much surface area they have facing south. And that's the cost right now.

MR. GRANIERE: Okay.

MR. WALLACE: Oh, yes. I brought the white papers that Vote Solar did for New Mexico and Arizona. I don't think the one for Arizona is a white paper. I think it's just addressing a couple of questions regarding the Arizona net

metering. But the New Mexico white paper on net metering is also in this packet. And Gwen from Vote Solar asked me to bring those with me, so I brought them.

MR. GRANIERE: Okay. Great. All right.

MR. WALLACE: Uh-huh.

MR. GRANIERE: Just one more question. So from what I'm understanding, and tell me if I'm wrong, I think what the staff is understanding is that the new improvements will -- you have a lower per kW cost, but you have a higher out-of-pocket expense, right? Am I right?

MR. WALLACE: Yes.

MR. GRANIERE: Okay. So what that says to me it seems like right now that the only thing that's controllable right now is labor costs. So what are you all doing about labor costs?

MR. WALLACE: We're building an infrastructure. As you see, the whole industry is not being represented today, but it's growing. In fact, the last time I talked to -- Bob can tell you, like the installer's course at FSEC is probably booked through the rest of the year. So there's a great interest in the state, there always has been, but it comes into is there a market there? And without a market there, what you end up doing is -- this is not the majority of the work of the solar contractor in Florida. The majority of the work of the solar contractor in Florida is solar hot water, because it's

affordable.

Until it gets to a point where we can get a guarantee of the rebate funds and, also, some type of subsidy towards solar, towards the industry, you know, like, say, we need some industry in the state. And I know that there is a grant program that goes along with the whole renewable energy program that just got passed, but in order to attract industry into the state I've been told that we need to offer the industry in excess of $20 million for a facility. And right now we're only offering up to two. So we're at about ten percent of what the industry is going to demand.

MR. GRANIERE: The industry -- Bob Graniere --

MR. WALLACE: PV, PV manufacturers.

MR. GRANIERE: Oh, PV manufacturers. So you're saying that a PV manufacturer to come to Florida needs to have $20 million in sales?

MR. WALLACE: To build a factory. I can get you in touch with a couple of guys if you want.

MR. GRANIERE: All right. I don't know about the other people, but I think I've learned a little bit here that it kind of says that -- maybe I'm wrong, but I'm just -- it keeps coming into my head over and over again, chicken and egg, chicken and egg, chicken and egg. I'm trying to figure out what's ever going to jump start this.

MR. WALLACE: Well, right now we're not paying a

realistic utility rate. We're not paying a realistic price on our gasoline. We're not paying -- for any of our energy, we're not. It's almost all being subsidized by the government. In fact, renewable energy, if it doesn't say hydrogen on it, it gets almost nothing, I mean, compared to the rest of what the industry gets. And photovoltaics and real clean energy that doesn't take a lot of mechanical work, what Bob was saying is absolutely correct.

You are looking at a durable good, a super durable good. And the majority of the cost is the photovoltaic module. And you're looking at a minimum warranty in the industry standard of 20 years. And 90 percent of the industry is offering 25 years to 80 percent efficiency. So that means if you felt like it, you could go up on your roof in 25 years, a month before your warranty is up, and go through and test all your modules. And if they're not making 80 percent, you could call the manufacturer and they could credit you. You know, I mean, this is something that is very long-lived, and you're looking at a life expectancy of these products way beyond the warranty issue. So a subsidy is kind of what the industry is looking for. It's what the industry is getting almost everywhere else in the world.

SPEAKER: One comment I'd like to make is one of our biggest problems is a marketing problem also, in that in the past year since 2006 when the federal credits were passed, we

spent close to $35,000 in marketing in major building and trade magazines for the consumer. And we tracked where every one of our customers came, and it resulted in almost nothing. We found that 95 percent of our customers came to us because of high utility bills. Most of the utilities went up anywhere from 20 to 30 percent in the past couple of years. And when they came in, we found close to 90 percent of them knew nothing about tax credits, knew nothing about rebates, or they had somewhat of an idea, about 10 to 15 percent of them, but it was jumbled up.

And once they found out about these credits and rebates when they came to see us, overwhelmingly they would go for something like solar hot water. And the decision for solar electricity would also come into play, too. To me one of the biggest things if we could get our governor on billboards around the state, saying, hey, do solar power. You know, if we could get all throughout the state news announcements with the governor, like on billboards, you know, some of the politicians, you know, to support this.

The lack of visibility and people even knowing these things are available really hurts us from a marketing standpoint. Every time we advertise, it really causes our costs to go up. It's unfortunate the only effective thing you can advertise in the State of Florida for the market is solar pool heating, where you find a list of every pool owner, you

send them a card and it costs a pool owner four to $6,000 to heat the pool with gas a year. And that's where the real chicken and egg comes is where is that tipping point where the public really feels like the government is behind it.

MR. GRANIERE: Okay.

MR. REEDY: Bob, I'd like to make a clarification. Bob Reedy.

The theme that I always pursue is that -- is not subsidy. I'm not against that, but I'm saying I don't pursue that. I pursue equity. And if you think about the slides that I presented, the issues I'm raising are all equity issues, being treated the same way as any other generator that behaves the same way, that sort of thing.

The subsidy question is more, I believe, more of a political issue that's outside the realm of the engineer and the economist. But clearly, those things are needed when an industry is -- those types of subsidies are needed when it's really in its infancy and it's really not thriving at all and not developing.

But I do believe that we're right on the edge of that time when that kind of becomes a moot point. In fact, I believe it's a scale of -- there are serious discussions about utilities becoming large owners of PV systems, and then we're talking about some serious scaling and cost reduction through the methods that utilities use today in the rest of their

business, computer graphics and design without ever visiting the site, aerial techniques, and that sort of thing.

So there is a lot of change on the horizon there, and I think it underlies the whole conversation, is how will things look in the world five years from now, which is very near in term, when this is the best peaking unit that a utility can come up with. That's the context that I like to work in.

MR. GRANIERE: Okay. Sure.

MS. HARLOW: Perhaps this is taking us down a different path, but as I prepared for today, one of the questions I wanted to answer in my own mind was we have an existing rule on 10 kW systems on interconnection. It mentions that the utilities can net meter. It's my understanding that that's not occurring today, and I wanted to kind of get a basic understanding of what the utilities are actually doing today. So, Susan, if you don't mind, I have a few questions.

First of all, my understanding is that the four major IOUs are using a single meter with dual metering capability, is that correct?

MS. CLARK: I was hoping you would ask me are they dual metering, and I could say some of them are using dual channels. The result of it is -- as it affects the rule, they are dual meterings, so they can price it under the as-available hourly or the average hourly.

MS. HARLOW: Okay. And as of about December last

year, the utilities had reported that they had interconnected about 46 small systems with a total capacity of about 155 kW. So we have seen some progress as a result of the rule, in my opinion. Ms. Szaro mentioned earlier that -- and I'm sorry if I mispronounced your name -- mentioned that the meters that IUC is looking at with the dual capability are about $150 apiece. Is that your understanding?

MS. CLARK: At least one utility concurs in that, and another utility indicates it's a lesser cost. I'll be happy to get more specifics on that.

MS. HARLOW: Okay. And at the current time, how are those costs being recovered? Are they part of rate base?

MS. CLARK: Now, if you are talking under --

MS. HARLOW: The metering cost.

MS. CLARK: Under the rule it goes -- the utility would have to pay for it. And you are asking how that cost is recovered?

MS. HARLOW: Correct.

MS. CLARK: I don't know specifically, but I would believe it would be put into rate base --

MS. HARLOW: All right.

MS. CLARK: -- as an investment by the utility.

MS. HARLOW: Now, also, could those existing meters on those existing 46 systems be used to net meter? And what I mean is if we assume that net metering is done at a retail rate

or a higher rate than as available, would it just be a billing program change to change the rate that the customers are receiving? There wouldn't be additional metering equipment necessary, would there?

MS. CLARK: You know, my guess is no, but if you give me until after lunch, I'll answer those questions.

MS. HARLOW: I'm putting you on the spot.

MS. CLARK: Judy, let me just see if I can get the specific questions you want answered, the cost of the meters, how the cost is recovered.

MS. HARLOW: Thank you.

MS. CLARK: And can the existing meters be used to net meter. And by that you mean used so that, in effect, the retail rate is paid or credited.

MS. HARLOW: Correct. Or some rate that's higher than as-available. My assumption is that that would be a programming change and not an equipment change. I just want to --

MS. CLARK: You want to verify that?

MS. HARLOW: Verify. Thank you.

MR. GRANIERE: Okay. We could probably move on to -- this is Bob Graniere again. We could move on to three questions here that were in the first part of the day, which I think we'll be able to get done by lunchtime, mainly because we have discussed most of them already, we just haven't nailed

them down by asking the actual question.

So the first one is -- I guess my first one is Question 5 on foundation. How would a cap on either the total number of participants or the total number of megawatts that receive net metering effect the expected achievements from net metering? We've heard a lot about what we expect the achievements to be, which are basically environmental, that's what I'm hearing so far. So I'm just wondering should there be a limit on the number of customers that are eligible for net metering, or should there be a limit on the number of megawatts that are net metered?

MS. CLARK: Bob, I think, you know, it depends on what gets net metered. I mean, what is the universe of possible customers that would be net metered. I know there are other states that do a system cap in order to, I guess, manage the impact of it and the subsidies from other customers.

MR. GRANIERE: So I guess one of the questions that -- you know, this is clearly a utility question issue, which is if the Commission were to come in and say, no limit, would the utilities say, oh, that's okay, or would they say, no, I think there's a problem there?

MS. CLARK: Well, Bob, I guess, again, it needs to get back to what are you trying to accomplish by it. And, you know, to me if you are trying to accomplish encouraging people to offset their own consumption, and it's not for the purpose

of putting it into the grid, not primarily wholesale generation, which I would point out probably is within FERC's jurisdiction, then your prediction of the size of the universe would come into play in terms of what that cap should be, either on the individual system or the system for the utility.

MR. GRANIERE: Okay. Sure.

MR. REEDY: Bob, I can contribute a comment technically. Bob Reedy.

There's a lot of technical work with the DOE right now on what happens at very high levels of penetration of DG, but particularly PV. And it's certain that up to the five and even ten percent levels of penetration -- I'm talking net, net in an area, you know, net generation in an area. I shouldn't use the word net in this conversation. Total generation in an area is not technically a problem. And I just thought I would contribute to that question, because, you know, there are issues that are financial and then there are issues that are technical.

Clearly, at very high levels, we're talking 25 percent or higher it has to be studied. But that's also not anywhere on the horizon.

MS. CLARK: Bob, this is Susan Clark. May I ask Bob a question?

MR. GRANIERE: Sure.

MS. CLARK: When you say technical level, I

presume -- here is how I interpret what you just said, is that within a given area you may run into technical issues if you are interconnecting a lot of this distributed resource. Is that what you're saying? And you say the threshold for that area is 25 percent of the load in that area?

MR. REEDY: I said that's considered a high number, and there are some studies going on at the 25 percent level. But it's confirmed that down around the five and ten percent levels there are no problems.

MS. CLARK: When you say no problems, what do mean? No problems for the system or the customers?

MR. REEDY: No problems for the system. In other words, voltage control, stability, oscillations of types. These types of system operating problems.

MS. CLARK: Okay.

MR. REEDY: And I didn't understand Bob's question to be pointed directly at that, but I thought, well, you know, we're here to bring out issues, and I thought I would bring that out.

MR. GRANIERE: Okay. Cayce, you had a question?

MR. HINTON: Yes. Cayce Hinton with the Commission staff. Ms. Clark had raised the issue about the intent of the distributed generator, whether it's about replacing their own energy use, or deferring some of their own energy use, or actually with the purpose of putting energy back into the grid.

In essence, she referred to being a wholesale generator.

I was wondering -- I think that's a legitimate distinction to make, just looking at the intent behind, you know, this particular PV array or that other form of renewable energy. And I was wondering if there is a threshold that we can identify, just in general. I guess we would have to break it down into residential for one thing. But a threshold that we could look at and say anything below this point we can safely say that that is just about the use in their own home, and their intent is not to actually sell electricity back to the grid. But above that, then, they're really looking to make some money off of this system in some way and not just defer their own use. And I guess that's just the general question that we may not have the ability to answer today, but I'm curious if there is a way to identify that.

MS. CLARK: Well, one way you would look at it is looking at the individual customer's consumption and see what the installation is. Is it designed to give it some percentage of its consumption, or is it designed to provide energy above what they use.

MR. HINTON: And if we're looking at it on a case-by-case basis, it's easy to do that analysis. But I'm thinking if we're thinking about a rule, and we're thinking about establishing a threshold, then is there a way to identify what that threshold is in a general sense that we can apply

across the board.

MS. CLARK: So what is the likely cap that if you are below that you have put it in for your own purposes is what you're saying?

MR. HINTON: Yeah.

MS. CLARK: Okay.

MR. BROWN: If I may --

MR. HINTON: The solar guys may be able to answer that.

MR. BROWN: Mike Brown. Yeah. I think that net metering on a residential level -- if we're going to split things up, commercial and residential, you earn -- even if you go into a ten kilowatt system, probably 60 to 70 percent of the houses you're still not going to be meeting all the electrical needs, especially in Florida. We have high, high, high cooling costs, as well as tons of pools, lots of pumps, motors and heating elements. You know, we don't utilize gas as much as we should on those points.

So a ten kilowatt cap on residential systems still is not going to meet your average customer's needs. You're looking at -- on a super efficient system, you're looking at 1,500 kilowatt hours a month, which, you know, I don't know if anybody in the room is familiar with looking at their utility bills and looking at how many kilowatt hours they use, but that's what it's based on. But I think that that's a good

starting point, is starting on residential systems at ten kilowatts and starting on commercial systems at 25 kilowatts, because that's the way the rebate structure is set. And we can start there and move around from there.

MR. JONES: Jeremy Jones.

I would encourage that we look at the policy not based upon a capacity of installation. But, again, are we looking at energy that's produced for their needs or above and beyond that. And if it's for their needs, then, clearly, the rule can just state that energy produced up to that point is credited at what level. And then above and beyond that, we may want that to be a different level, I don't know.

But it's just -- you know, if you look at a given time period, a lot of the net metering policies are either a month or year, and I'd encourage it to be over the course of a year. Over that 12-month period was the net production or was it still a consumer? And energy that goes above and beyond what is consumed at that location can be outside of your rule, if you want it to be, but rather avoid setting kilowatt limits based upon a current incentive level that would limit growth in the state and would have to be changed on an ongoing basis as systems get larger and larger. And I think already there's opportunities for much larger commercial systems than what is incentivized in the current program. So I would just, again, avoid the kilowatt limit.

SPEAKER: (Inaudible).

MR. JONES: Conergy.

MR. GRANIERE: Okay. And what would you substitute --

MR. JONES: Looking at it --

MR. GRANIERE: -- for capacity?

MR. JONES: Looking at it on a kWh basis, not on a kilowatt of capacity basis. And I believe if that's how, you know, most of the programs currently operate. The net metering policy applies to kWh that are ultimately netted out. And if you produce more than what you're using, that may not be part of the net metering policy at all. So the language is -- it's inherent to the language, because you're talking about energy that's used within this net time period.

MR. GRANIERE: Okay.

MR. WALLACE: Wayne Wallace. I'd like to agree here and basically comment on Jeremy's comments that I think that's definitely the way to probably look at this. You know, if you have a customer that has a small little 1,500 square foot home, and they want to do the two kW system, you know, they're going to generate probably not more than their -- I mean, they're not going to have excess power, you know, wholesale going into the grid, which the utilities would like.

On the other hand, you could have a large corporation that wants to do the corporate green responsible thing and put

in a megawatt system, and their electric bills are $50,000 a month, they also would not be generating wholesale energy to the grid. So I think that's good for the utility. So I really think that's an awesome way to look at this.

MR. HARRIS: This is Larry Harris.

So thinking from a rule language perspective, I think what I'm hearing is that you all would encourage the language to say something to the effect of the consumer, however we define that, installs a system. And it sounds like you're sort of talking about one meter here, basically. And on January 1st, you look and see what the meter reading is. And on December 31st, or the following January 1st, somebody, the power company meter reader, somebody comes out and looks at what that number is. And says, okay, is the number positive or negative.

If it's positive, that means they consumed some power, and the utility bills them for whatever it is. If it's negative, it means they produced power and put it back on the grid. And the utility says, okay, we're going to purchase that negative amount at a different rate than we would have sold them power, the retail rate. So the rule would sort of say, would lay out this sort of -- and, obviously, I don't think any IOU is going to be happy with yearly billing -- but, you know, something along those lines, that the meter reader comes out, sees what the number is. If it's positive, the consumer gets a

bill. If it's negative, the consumer gets a check at a different rate that the rule would specify what that different rate is.

And you would suggest that for any installation as opposed to -- and that's following up on your comment. That would be for any installation, whether it's the guy who has got a 1,500 square foot house or Wal-Mart that wants to put in something for their entire unit. And so then as long -- it sounds to me, and I would suspect the utilities would want to weigh in on this, but it sounds to be then if that's the paradigm at the end of the day, if that purchased rate that the IOU is paying or the municipal or whoever is paying Wal-Mart for the megawatt that they generated, if that's fair, if that's set at the appropriate rate, that there shouldn't really be any problems there from anybody's perspective, because the utility is getting this excess power at some type of rate that's fair to the general body of ratepayers and to the person producing it. And the person producing it can say, okay, do I want to have enough to power my house or my store, or do I want to convert the entire parking lot into covered parking with the cover being photovoltaic cells that's going to generate 200 megawatts of electricity, and I'm going to defer the need for a coal-fired power plant next year. That's what I'm hearing. I'm seeing some people shaking their heads. I see Susan has a question.

MS. CLARK: I would just mention this concern, that you have to keep in mind that the ability to serve that customer still has to be maintained. The infrastructure has to be maintained, transmission and distribution, so you get into what is the appropriate standby rate for these customers. So, you know, when you increase the size of the self-generation, you are going to run into issues regarding the rate design.

MR. HARRIS: But would that standby rate be part of this rule? Would we have a rate design for that or would that be simply referenced back to some other tariff --

(Tape change.)

MR. HARRIS: -- in your mind? And I don't know the answer to that. And I agree, if Wal-Mart says they're going to install solar panels, and we have ten days of cloudy skies, and they're using, you know, a megawatt a day, there's got to be some system capacity to meet that need.

MS. CLARK: I think the point is that there are costs that are going to remain, that when they are not -- when you are net metering, they are not going to be recovered from the customer, for that particular customer, so where are those costs going to be recovered, the remaining ones, and is that the appropriate rate design?

MS. HARLOW: Going back to that point, it occurred to me that the kilowatt hours produced by a small system on a customer's house, on a residential house are very similar to

the concept of conservation in that they are not using that power from the utility, and yet the utility still has the obligation to serve that customer that is conserving energy, so -- and the utility is not recovering anything in that case. So I don't know. I was just comparing conservation and the kilowatt hours saved from my putting in a compact flourescent light bulb to my putting a PV panel on the house and it produces ten kilowatt hours, and so I'm not using that from the utility.

The utility is still on the hook, though, with the obligation to serve my household. And I understand that that issue is handled with a business customer because of the standby rate that you mentioned, but with a residential customer it really isn't.

MS. CLARK: I guess, Judy, in response to that I would say that when you do have some of those conservation measures that you put in there, there may be a higher degree of predictability in terms of your revenue from that customer; whereas, if you have something like a solar array, the predictability of what the customer will use may be more difficult.

MR. REEDY: Bob Reedy. I would differ on that, that it's actually more predictable than the effect of conservation. Again, you tell me -- you tell me exactly where it is and what it is, and you can predict the output very clearly.

SPEAKER: I'd also like to make a comment that, you know, when you look at a system of about ten kilowatts, for an example, at the current rates in Florida, that would save a customer, either he, the customer using it or net metering, about $2,500 a year. The biggest problem as solar contractors we often get into is somebody reads or hears about a system that costs 30, $40,000 in California and they say it knocked out their utility bill. Well, usually they are talking about northern California where people aren't air conditioning or a lot of California people aren't even using any air conditioning.

As long as you're having an air conditioning load, you're not going to even come close with the ten kilowatt system of reducing the homeowner's use over an extended period of time. And one of the things never to forget is we're talking about diminishing fossil fuels, that we're actually -- within this century or the next 150 years, there's not going to be any of these fossil fuels running out. That's a very, very short time period.

When you look at -- for an example, you look at a person driving a Hummer. Years ago people would say, oh, well, he's just spending a lot of money, maybe he's a fool to do this, it's his money. But if you look at it now, that person is sucking on the straw a lot faster than all of us. That lake of oil is going down very quick. So that person who is using a

Hummer and has a high end is costing us all, the fact that we will run out a lot quicker. And anybody who's putting up a solar electric system is delaying for everybody the day that's dawning in the near future when we're not going to have these fossil fuels anymore.

MR. HARRIS: Larry Harris, again.

And I hear what you're saying, but I guess I'm -- I've been listening this morning, and I'm taking a little bit different view in that presumably I'll be the one trying to draft language for a rule. And I'm hearing a distinction between sort of societal and policy and legislative issues and what the PSC has jurisdiction to do in a rule.

And I don't know that anybody has discussed it, and I think probably Bob has got it on the agenda, you know, what jurisdiction the PSC actually has for a rule. But I suspect it doesn't include incentives or policy issues. I suspect if we have jurisdiction, it probably does mean that we can draft something that says, if you are this size or you use this many kilowatts or this many megawatts, you can put in this type of meter and get this type of credit against your bill. And so that's sort of what I'm listening for.

And the reason I say that is not to cut the discussion off, but just to tell you from where I'm sitting, having to draft a rule, I'm listening for things that -- and that's why this discussion I just had with you was so helpful,

because I'm listening for alternatives that I can use to put down on paper to get something out there that people can start looking at.

And, you know, we've had a lot of discussion about photovoltaics today, but realistically, I haven't heard a lot of people say, other than Bob Graniere, that that's sort of going to be in the rule. And I don't think we've made a decision is the rule going to say net metering applies only to PV systems, or is it going to apply to any, you know, renewable system, or is it going to apply to anything.

You know, if I want to go ahead and buy a Kubota diesel generator because I'm worried about hurricanes and decide that I can get a really good deal at Sam's on diesel fuel, I'm going to run that thing 24/7 and put energy back into the grid. Do I qualify for net metering?

SPEAKER: The generator doesn't qualify.

MR. HARRIS: Well, I don't know that we've decided that. You know, if we're going to say, you know, if the meter at the end of the day, or the month, or the year is negative or positive, if I can get cheap enough gasoline from Sam's to run my Kubota generator, then maybe I'm qualified for net metering. You know, I don't know.

SPEAKER: (Inaudible.)

MR. HARRIS: Yeah. You know, I have a cow farm, and I can hook them all up and burn that methane somehow. I don't

know. But, you know, when I'm drafting the rule, this is what I need to be thinking about. And so that's sort of what I've been listening for today. And probably the rest of you all, you know, have been thinking those things and not made them clear to me.

MR. GRANIERE: Well, I'm happy that it's not exactly clear to you, because the answer was that only photovoltaic people have showed up here. But it just seems that in the course of a discussion things like that always come out.

I mean, it's not that far-fetched to have a digester in the back of your yard, actually. It's not that far-fetched. It's not that far-fetched to try to gain the system, as you were suggesting, which is that you go out and you buy a diesel generator, and then you try to make money to gain the system.

But then, again, everybody gains the system on all sides. It's what we do. That's how we make money. So we should stop it from gaining the system on something that's clearly not the intent. We should stop it from doing that. That's why we did raise the issue here of are we only talking about photovoltaics, as you said, or are we talking about a much wider group that's called distributed generation.

I think that we were right on the money on the initial definition of what's eligible for net metering, where we're talking about the location of the facility. Does the facility provide any excess into the distribution part of the

network, or does the facility provide any excess into the transmission part of the network? I think that makes a huge difference. At least for me that would make a huge difference.

I would think of a DG that provides excess at the transmission side of the system as being nothing more than a very small IPP. It would have to do all of those things that any IPP would do. And I think that a case, as Susan said, can be made for the fact that that's a wholesale sale, and that we'd have to think about that. So is it important that the electricity goes in at the distribution side? But, of course, if the electricity goes in at a distribution side, then a whole lot of different technicals stuff happens. There's a whole lot of things the utility doesn't have to do it just seems to me. I mean, I'll leave it up to the engineers to tell me that I'm wrong, but my guess is that nobody is taking distribution, energy that goes in on the distribution side, stepping it all up to transmission levels and then stepping it back down again to distribution levels to sell it.

I kind of think it's sort of just making a right-hand turn and going to somebody else. But, of course, I'm not an engineer. You know, I never got a degree. I just couldn't get through that last course that said I actually had to learn how to use my slide rule. So I just couldn't do that, so I became an economist, because I don't need a slide rule to do that. They can just make up stuff.

But in any event, it's just -- you know, I'm just kind of pretty much -- you know, I think I'm right, that there's not going to be all this stepping up and down, you know, for five kilowatts. I'm just pretty sure of that. So I think, you know, we need to think about that, you know. And I think that brings us into this here next question that we could get done before we break for lunch.

SPEAKER: Bob, I'm sorry to interrupt.

MR. GRANIERE: Yes.

SPEAKER: One thing I want to clarify. I'll make it two minutes or less. When we talk standby, we usually -- that's accepted as not a parallel operation where you have your own self-generation and you count on the utility to be ready to serve as standby. We're talking about a parallel operation. So what I really think we would be talking about is a residential demand rate. And when we go that direction, then we're back at the point I raised about strip heating and other issues. I mean, they go both directions. The same effects occur whichever way the flow is. So I think it's not a standby rate.

MR. GRANIERE: Okay. And then I think the last one we could do before we break for lunch is -- and this issue was raised by the gentleman there at the end, which is, basically, what do we do with something that comes in under a lot of different names, one is net energy, net excess energy, another

one is net energy to the grid, and the other one is excess of excess.

And, basically, what we're talking about here is that when the meter -- in the very simple application, it's when the meter shows that it went down instead of went up. How much, under a net metering rule, should that be the retail rate and, (a), should there be bank and; (b), should there be banking, if there is any need to bank and; (c) if there is a need to bank, when does the bank close or does the bank stay open all the time? And if the bank closes, does it close -- at what level, so to speak, at what price does the market sort of close when it does close?

And those are, you know, those are those questions that have to do with when the net meter is actually showing that the customer who put this in, in the end actually provided some energy to the distribution network. And I don't know, does the -- in this little handout that we had, you would see, if you look at it, that the treatment of that particular issue is all over the board nationwide. And I guess -- here is a point where I just have to sort of look at it -- well, I'll first look to you and see if you have an answer, and if not, you go talk to the utility guys, which is what would you think is the right thing to do with that?

MS. CLARK: Well, at this point I think we would agree with Jeremy, that that excess energy -- I'm taking in, in

answering this question, the thought that the staff believes that there should be net metering. And, in effect, the net metering is you get retail rates for what you don't use or -- I'm getting -- let me just get back to your question.

MR. GRANIERE: Okay. I'm not a lawyer, but I understand I asked one of those ever popular compound questions. So, you know, I'll try not to do that. I guess the answer is, is that what we're talking about is let's say we have ten -- the meter shows that ten kilowatt hours were, essentially, given to the distribution network, and now it's time for the company to pay up. Okay.

Does the company pay up with cash, or does the company pay up with a credit? Those are the two options. They either pay up with cash or pay up with a credit. If they pay up with a credit, they've essentially banked what was sent there, because that credit will reduce the bill in the coming month, okay. Or they could give cash, and that would just be cash at the end of the month.

If you give cash at the end of each month, then there is no need for this thing -- for the bank to close, because the bank never opened. Basically, you just paid it dollar by dollar by dollar. But let's say that there's a credit. So we've gone through the credits and there is offsets the next month and the next month and the next month.

Now, if the credits can be carried forever, well,

then, they will just be carried forever. And if the credit is transferrable to a new owner, they would continue to carry forever, too. And, once again, the bank would never close. And it is always being credited at the retail rate. That's one thing that could happen in some states.

Now, in other states, though, they say at the end of some calendar year, or at the end of some 12-month period, they look and see what's left. Are there any credits left? And if there are credits left at the end of the 12-month period, how are they compensated?

In some states there is no compensation, and they are donated to the utility. In other states they are compensated at the retail rate. And in still other states they are compensated at somewhere between zero and the retail rate. So my question here for Florida would be -- well, we all know -- I mean, each party will have what they would prefer the compensation to be. And I was just wondering what, you know, what it would be? Would it be zero, would it be the retail rate, or would it be something in between?

MS. CLARK: Bob, if I --

MR. GRANIERE: But this, of course, is a hypothetical, assuming that we have net metering at a retail rate.

MS. CLARK: Yes. This is Susan Clark, and I guess what I have been hearing is that for the representatives from

the solar energy industry that are here today, what is important to them is the net metering. And that being paid for the excess energy, even if you get twice or whatever, it is not -- it's not what would drive a decision to put it in. It seems to me that it should be treated like other generation and be paid the avoided cost.

MR. GRANIERE: So, basically, what I'm hearing you say is that right now the position that's being put forward is that there would be, essentially, no change in the current system.

MS. CLARK: Under the current rule, yeah.

MR. GRANIERE: Yeah. Essentially, no change under the current rule.

MS. CLARK: Yeah. And if you're thinking of changing it, what would be the benefit that you -- first of all, that the potential distributed resource would gain by that. Does it further, sort of, the ball as far as the public agenda.

MR. GRANIERE: Okay. Well, I think that this is a good place to stop, because I think it just gives everyone something to think about as we come back. Because, basically, what we're hearing here now is we're hearing questions about cross-subsidization, we're hearing questions about what's gained by solar deployment and, also, what's gained by providing -- about the distribution of, essentially, a rent, to use an economic term. Who gets to make money off of it, I

guess is the answer. And I think we just need to talk about that. And maybe the answer is some sharing between the two. You know, the old split the difference or something. I don't quite know.

MS. CLARK: When you said -- you mean like under the broker system, is that --

MR. GRANIERE: Well, it's something -- you know, I'm not really sure about, you know, what may happen. I'm just sort of thinking that if -- what I'm thinking is that if the excess -- or if the net energy -- if the net excess energy is paid at as-available, which is, essentially, a wholesale rate, when it's resold, it's resold at a retail rate, which basically says that the person who bought it at a wholesale rate is making money, because they're reselling it at a retail rate. And so we need to talk about -- and that's a rent, and the answer is who is going to get the rent?

You know, how are we going distribute the rent? Is the rent going to be distributed between the two parties, or is the rent going to go to only one party and not the other? I'm just not quite sure. What I have heard thus far is that while the rent per unit may be fairly large, the actual number of units aren't all that large. So on the overall finances of the company there is not a major impact one way or another. And so we need to talk about that, too. But that's how I kind of see it right now.

MS. CLARK: Well, let me just point out when you say who gets the rent, I mean, it is the remaining customers who will be paying for the cost of the excess generation.

MR. GRANIERE: Well, that's what we have to talk about. Because, basically, what we need to get into there is -- and that's why I think we need to get into it there is that we need to talk about what additional cost does a utility actually incur when they take power on the distribution side? And what my gut feeling is, is that they don't incur a lot of transmission costs. And that's my gut feeling.

And my gut feeling is that they -- maybe they incur some additional distribution costs, but I don't know how much. But that's what I'm kind of thinking. But then, once again, I'm not an engineer. But all I'm just thinking about is how the power would go.

I mean, you know, what I'm thinking about is something that's similar to an old telephone system which, basically, says that you had this remote station out there, or you had a station, and you were served by the same station, and you send the telephone call to the guy next door, you know. Well, of course, the telephone call didn't go directly to the guy next door. It doesn't even do that now. Even if you have a cell phone it goes someplace else and then comes down. Well, they all used to go down this -- you know, this last mile stuff to the Class V office, something happened there, and go back to

another thing to another telephone right next door. Another copper wire. Bang, bang. That was it. It never got into any of the other switching systems or anything else. It just went rang, rang.

Well, I'm kind of thinking that when this stuff goes into the distribution grid, it goes to the first point where there's some kind of node in the network, and then it sort of makes a right-hand turn and goes somewhere else. And so -- I mean, how much costs are involved in that? I mean, what, a tenth of a cent? I mean, I don't know. You know, but I think I need to know that. I think everybody needs to know that, so that we can get on this issue of this cross-subsidization and all that other stuff.

I mean, you know, I just think that a lot of the cross-subsidization debate really hasn't really talked a lot about just following that old electron around. And, you know, yes, it does, it does -- you know, the electron does commingle. There is no doubt about that, you know. But the question is where does it commingle, not whether it commingles or not. The question is where does it commingle. And I think that's something we need to talk about, and stuff like that, so we get a sense as to what it might be.

So with that, it will give you something to talk about, and I'll go eat lunch.

MS. CLARK: What time do you want us --

MR. GRANIERE: Come back at -- one hour?

(Lunch recess.)

MR. GRANIERE: I'm ready. Okay. We're running a little bit behind schedule. What a surprise. Okay. So I think it's -- we might want to start going into these eligibility requirements and technical issues and then on to financial and rate-related issues. And then, of course, there's recordkeeping and reporting.

So I'd like to sort of just start out with the first question, and see if we have anything that we could add to this particular question. We have talked about it. I just wonder if there is anything to add to it.

The question is, should there be a size ceiling or a technology boundary on renewable energy sources when net metering is mandatory? And, basically, the question just here is how big might a unit be that would be eligible for net metering, and what type of renewable resource might be eligible for net metering?

Since the staff has placed, at the present time, no limits on either one, I'm asking like, you know -- we're asking you what size you think is the maximum size of a facility that should be eligible for net metering and what types of resources should be eligible for net metering. I think we've heard so far that there was one proposal put for 10 kW for residential photovoltaic and 25 kW for commercial photovoltaic, is what

I've heard so far. I've heard nothing beyond those numbers and nothing as to other types of renewables that may be eligible for net metering. So I open the discussion to anyone who wants to answer that question as to what it might be, or whatever.

MR. LANE: I think more appropriate it would be like 25 for residential and like 100,000 for commercial.

MR. GRANIERE: Kilowatts are you talking about?

MR. LANE: Uh-huh. I mean, I'm just talking about basically unlimited for large commercial. I mean, there may be a point where the utility really reaches a point as to how much can you effectively feed back into the grid of the transformers and everything that's there that would -- you know, to me, the way I look at it is whatever the utility company is feeding into the building, the building should be capable of feeding back.

MR. GRANIERE: Frankly, I'm lost. I don't know what you're --

MR. LANE: Well, it would depend -- let's say you had a large commercial facility. You're set up with a certain amount of power from the utility company through their transformers to feed power into that building.

MR. GRANIERE: Okay.

MR. LANE: The facility should be able feed the same amount of power back.

MR. GRANIERE: During the entire day or when it's not

using it?

MR. LANE: Well, I'm talking about the power the building, you know, would be generating on site. Like if you have a Wal-Mart, you're going to have -- there's going to be a certain amount of power that's capable of going into that building based on the facilities of that building and the transformers outside as opposed to, say, like an orange juice place that would be processing and manufacturing orange juice. Well, those people have a certain amount of power that's going on based on what the transmission lines the utilities have put into the -- into their facilities to operate the facilities.

MR. GRANIERE: Okay.

MR. LANE: Based on their needs.

MR. GRANIERE: Okay. I'm sorry, I'm just not understanding. Let me ask it this way: There's this building, there's this commercial building, and it uses 50,000 kilowatt hours a month. If it didn't, it self-generates.

MR. LANE: Uh-huh.

MR. GRANIERE: Okay. Then it goes out and it puts in a self-generator. And I'm not going to talk about what -- how you do it, but you self-generate on site. And let's just say the self-generator generates 50,000 kilowatt hours a month. Okay?

MR. LANE: Well, I'm thinking about --

MR. GRANIERE: What would be sold?

MR. LANE: What power -- power, though, is instantaneous in time, that one second. You know, when the sun is shining on a unit, when you talk about a ten kilowatt system, that means that the sun is hitting it, right there that one second it's producing ten kilowatts of power. The time only comes when you go for hours or periods of time for a billing process. But we're talking about how big the system can actually be instantaneously that one second in time with the sun fully hitting it.

MR. GRANIERE: Okay.

MR. LANE: And I would say a residential system should be capable of doing at least 25 kilowatts and a commercial building, at the very minimum, 100 kilowatts. But the transmission line to the homeowner's facilities -- let's say if a homeowner put in something outrageous like, and this has happened, three or four instantaneous electric water heaters, each producing -- or requiring ten kilowatts of power. And that person in that home is taking a shower, all three of them are using. Well, the utility is going to have to upgrade the line for that particular home.

Well, like in a commercial building, whatever size that commercial building is, they're making those lines and transformers to carry the power into that building at that one instantaneous second in time to produce that power.

MR. GRANIERE: Sure. So what we're talking about is

that when you say it's -- so are you saying that the size should just be the size that the customer put in? Is that what you're saying?

MR. LANE: Well, that's one way of looking at it, that whatever size the utility has put in to send in that much power at that one second in time, which the facility may not be using it, you know, that much power at that second in time, that why not let the person put back that much power into the grid, because it's not costing the utility anything because transformers work both ways.

MR. GRANIERE: Okay. All right. So let me try this one. Okay. Let's say that the -- let's say I'm in an apartment, and my maximum draw is six kilowatts at any time during the day. And I go out, and I put in -- for some reason I put in an eight-kilowatt system. Are you saying that I should only be able to send six kilowatts because that's all the utility would send me?

MR. LANE: No, because the utility probably is capable of sending in -- well, a lot of buildings have -- or just residential homes have a 200 amp service in the home.

SPEAKER: Tom, are you basically talking about building out to the capacity that the utility has infrastructure coming in, the capacity of lines, as being able to build out to max out whatever is coming in?

MR. LANE: Correct.

MR. GRANIERE: But I guess my problem is, is I have no idea what you're saying is coming in.

MR. LANE: Well, that would depend on the individual home or the individual business to be rated for what they're actually using. If a home was using much more power than another home, the utilities would have to upgrade the facilities to provide that power.

MR. GRANIERE: So, then, I think what you're saying is that the size limit should be whatever the guy builds?

MR. LANE: Correct.

MR. GRANIERE: Oh, okay.

MR. JONES: To some extent, based upon what we were talking about before, I think that that could be automatically built into the language of the program. If the program is designed such that you're only credited the full value for energy that you're capable of consuming, because you're not going to greatly oversize the system when there's not a lot of benefit in doing it. So if the program is structured such that you're getting retail pricing for energy which will ultimately be consumed by you as the customer, you're automatically not going to oversize the system. And, therefore, you don't need to have a formal limit in place. Jeremy Jones.

MR. BROWN: If I may. Michael Brown. I gave away all my Arizona papers, but in that net meter paper it points out -- this is the New Mexico one.

Here, is that it?

But, anyways, it basically goes along the line of what we were talking about before we broke for lunch. And that is net metering to consumption and if, on a month-by-month basis, if there is a surplus generated in a month that surplus is credited to the next month as kilowatt hours. And then at the end of the year, if there is still a surplus, then, of course, it would go to the wholesale rate. But so long as that's consumed, it would be kept at the net metered rate.

MR. GRANIERE: Yeah. I understand that.

MR. BROWN: But you want to dictate a size --

MR. GRANIERE: Yeah.

MR. BROWN: -- for the systems?

MR. GRANIERE: Yeah. We were talking about that just before lunch, which is, you know, what do we do with the net excess?

MR. BROWN: Well, the size of the system -- say the house is a 200-amp service, most new homes 200, a lot of them more than that. For a 200-amp service, that gives you an opportunity, electrically, you know, there are a lot of physical restrictions as well, but it gives you, electrically, the capability of 48 kilowatts. And that's a huge system. And a 25 kilowatt roughly comes out to just less than 100 amp service, if you are going by the home's electrical service. But that would have to be determined by local building

officials, if that was going to be the way it was worded or structured.

MR. GRANIERE: Uh-huh. Okay. Is there any -- Susan, do you have any recommendations?

MS. CLARK: Susan Clark.

Yes, Bob. On this one, we think that our current ceiling on the size is to 10 kW for the residential is appropriate, and that is what you have in your rules for the PVs. What I'm hearing today is the suggestion that the technology boundary should be the PV and solar, and I think that is the technology and that the general public would support as being a truly renewable resource. And if it is likewise a technology designed to provide -- to offset the use of the particular customer, that would be appropriate as well.

MR. GRANIERE: Okay. And do you have any position that you would like to share on commercial or manufacturing type applications for size?

MS. CLARK: I think that's one we would want to think about a little bit --

MR. GRANIERE: Okay.

MS. CLARK: -- as to what is the appropriate size. Again, I think it should be tied to the notion that the purpose is to offset your particular consumption, not to put power onto the grid.

MR. GRANIERE: Okay.

MS. HARLOW: Can I ask if the IEEE standards on -- I'm losing my microphone -- IEEE standards on inverters and on interconnection are relevant? I know 929 on inverters. I believe there is some controversy over whether that covers just 10 kW and below systems, or whether it covers larger sized systems.

MR. REEDY: Bob Reedy from FSEC.

929 has actually been superseded by IEEE 1547. And there is not a -- I'm not sure. I'm going to have to get back on that, exactly what the limit is, but I know it's not a low number. It's not 10 kW or something like that. Maybe some of the fellows that install do know.

MR. BROWN: Yes. Mike Brown, again.

I think ten kilowatt is the minimum -- I mean, they have to allow access up to. It's not a maximum number, it's a minimum number. But it's not a -- it's not saying you have to put in this much. It's saying that you have the right to access at least that much. Am I correct on that, Tom?

MR. LANE: That would be the ceiling, wouldn't it?

MR. BROWN: No. What it does, it ensures that no one can come in and restrict you regionally to less than 10 kilowatts. It ensures access to at least 10 kilowatts. It's not a ceiling. It's a minimum access. I don't know what the maximum is.

MR. GRANIERE: Okay. Let me see if I understood what

you said. I think I heard you say that if a utility or a person providing interconnection said you could only interconnect six kilowatts, and you were to show up and say, no, I'd like to interconnect ten kilowatts, that you're saying the standard says the utility has to do that?

MR. BROWN: Yes.

MR. GRANIERE: And --

MR. BROWN: As I understand it.

MR. GRANIERE: Okay. And then what would happen if a person showed up and said I have 20 kilowatts that I'd like to interconnect?

MR. BROWN: As it stands now, that would go to where we are at now, at the state level and trying to figure out where the state standards lie.

MR. GRANIERE: Okay. On to the next question. I think we talked about this, but we could just sort of get sort of just a position on it, which says, should net metering be confined to customer-side distributed generation? That means distributed generation that's at your house and that would normally be connected to the grid using distribution facilities rather than transmission facilities. What do you all think about that?

MR. REEDY: I'll give it a start. Bob Reedy.

Certainly, in the comments I made earlier, the benefits that I mentioned were all only applicable to the

distribution side. I mean, it was -- not all, I guess, but the majority. I mean, the thrust of the whole value proposition comes at the distribution side. So, especially when we're talking PV, we're not talking central station type.

Were wind energy, something that was being discussed here in Florida, we would have those issues. It would be very relevant, because it is certainly considered renewable, but it is also generally a central station type of plant. Small wind is the other category, and it fits on homes. It hasn't developed in Florida, because we don't have the winds in Florida.

MR. GRANIERE: So I guess -- would it be fair to say that the position that you put forth is that if we're dealing with PV or, I guess, solar thermal to the extent that that would happen, I don't know if it would, but let's just -- well, let's just stay at PV, something we know about. You're saying that net metering should be limited to customer-side? Is that what you're saying?

MR. REEDY: Well, I'd be careful to say that the benefits that we see for the distributed generation which warrant the net metering -- I'm twisting the phrase a little bit -- are most certain and solid on the distribution side.

MR. GRANIERE: Okay.

MR. REEDY: I wouldn't want to make a blanket statement, because sometimes there are some unique scenarios.

The subtransmission grid needs a little support in some area, and you have something that boosts that. But that would be a case-by-case analysis.

MR. GRANIERE: Okay.

MS. CLARK: Bob, this is Susan Clark.

I have to confess to being a little confused by this, because it seems to me the concept of net metering has in it the idea that you're offsetting consumption, and so it is a customer-side concept. And it shouldn't apply to a transaction that's primarily a wholesale sale.

MR. GRANIERE: You know, that's what we're trying to balance. We're trying to balance the fact that we have net metering, we have renewables that are more than photovoltaic, and then the question then becomes should renewables that may connect to the transmission side, but be small in the sense that they are only in the one to two megawatt area, should they qualify for the same type of rate treatment as a customer side?

I mean, it's up in the air. You know, it's just something you would think about. It's an issue that has been discussed elsewhere, because that's what happened in New Jersey and in Colorado. So we need to, you know -- and they have their reasons, and they are somewhat broad in what they want to do. Just a question as to whether we might go down that road.

MS. CLARK: Well, if I might point out, what it seems to me you're saying is is there some amount -- is there some

type of generation out there that should get more than avoided cost. I mean, if it's not being produced for their consumption, how can it be a net metered proposition?

MR. GRANIERE: Yeah. Well, I guess what I'm trying to say is -- and this is totally personal for me. So this has nothing to do with the Commission, Commissioners, or anybody else. But as to the statement are there some power out there that may have to be greater than avoided cost, depending on how we define it, I could think of a way that if we define avoided cost and restrict the avoided cost strictly to private cost and benefits, I would then say yes.

If I were to take avoided cost and include in some benefits that we don't normally consider as a private cost or a private benefit, then I would say the issue is moot or a non-issue, because then avoided cost is whatever you say it is, and you get to that situation. It's sort of like the externality adders situation. Sort of like that, but not quite like that.

So I really -- but I don't think the net metering gets to that, to tell you the truth. I really don't think the net metering gets to that particular issue, unless we decide that net metering should apply to a renewable that does not -- that connects on the transmission side and not on the distribution side.

MS. CLARK: I think then you're just disguising

really what it is. You're paying more than avoided cost for generated power. It is not net metering. But, you know --

MR. HINTON: This is Cayce Hinton. You know, when we start to get into a practical discussion of actual rule language, and we start to think about, okay, can we create some kind of threshold whereas somebody that installs 10 kW of PV on their roof, we can say that's a pretty -- you know, we can use that as a threshold saying this is for personal consumption. Anything over that, you know, we can address through net metering laws.

But if you just have that threshold of 10 kW with an assumption that's for personal consumption, then you may inadvertently capture this guy who has built a trash burner in his -- on his farm somewhere that's generating that amount, but purely for wholesale, you know, sales. You know, it's just wanting to be able to specify, you know, whether -- you know, what we are trying to capture by particular thresholds, and do we need to specify this is the -- you know, on the consumer side or can we just have the threshold. You know, I hear you saying that if we're going to talk about net metering, then we do need to, you know, specify that it's, you know, it is the consumer's side or it is just a wholesale transaction.

MR. REEDY: Bob Reedy with a comment there.

I share a concern that -- you know, I'm clearly trying to advance the development of photovoltaics. I share

this concern that if we -- if we're not careful, we can create a scenario where a very repugnant type of generation is brought in under this umbrella. And, clearly, the intent is to more or less match consumption. I mean, I like the idea of striving to come up with something, not a -- I don't like a number, so many kW, because houses come in all types and consumption. And, in fact, many people who put in these systems are very energy efficient homes.

But I like the idea of some language that gets it tied to the idea of consumption. I'm a little bit redundant there, as opposed to setting in what I used to call a saw rig, you know, a meter on a pole and putting PV out in the field and having no consumption and calling that net metering. That type of scenario is not healthy, I believe, in the development of the industry. And I think I would like to see something come out that way.

MR. GRANIERE: Okay. Let's follow this a little bit farther then. Suppose that there was some -- Florida has a somewhat broad definition of renewable. It's in the legislation. Suppose we take any one of those technologies as designed, designated as renewable, keep it under whatever size limit we pick, build it on our own property, connect it to our house and use some in our house and sell the rest. Would that be net metering? It is a renewable, after all, by statute.

MS. CLARK: I'm a little confused by you saying would

it be net metering. Yeah, it would be net metering. The question is should it be net metered?

MR. GRANIERE: Okay. Should it be net metered?

MS. HARLOW: If you look at the North Carolina net metering rule, they have very similar language to what Bob is speaking about. They do have a size limit in it, depending on whether it's a residential customer or a commercial customer, but there is also some caveats in addition to the size. And one is that it must be located on the customer's premises. It must be interconnected and operated in parallel with an electric utility's distribution facilities. And also the system must be intended primarily to offset a portion of the customer's own electricity requirements.

MS. CLARK: I'm sorry, Judy, I'm not familiar. What does it define as renewable?

MS. HARLOW: And I'm just learning myself, because it's a new field for me, and so I just got this. Defining as a renewable hasn't -- has the source of electrical energy or renewable energy resourcing, including photovoltaics, wind, biomass, microhydro and solar thermal electric. And the capacity I spoke to earlier is not more than 10 kilowatts for a single residence, and not more than 100 kilowatts for facilities supplying commercial, institutional, or industrial facilities.

MS. CLARK: Bob, I think that as a public policy

matter, you probably don't want to include all the things that are included under the definition in the statute. I think a consideration needs to be given to the type that you want. First of all, does it need to be incented, and is this the appropriate way to incent it.

I think, also, that you want to be careful about, I guess, the opportunity to gain the system. Is there an opportunity to provide energy on the grid when it's really not needed as opposed to when it is needed, and you don't really accomplish anything as far as avoiding, I guess, the nonrenewable generation that you're trying to avoid. So I think those are considerations that need to come into a decision as to what should be eligible for net metering.

What good is a system that's going to give you power in the middle of the night? And, in fact, that can be detrimental, because you will have to back down other units. So I would say you want to limit it to intermittent sources. Certainly, it appears most of the states direct it at solar.

MR. GRANIERE: Okay. And, Susan, I heard Mr. Reedy say small wind, if we had any, something like that.

MR. REEDY: I wouldn't -- I guess it's policy, but I wouldn't exclude small wind, because it has the same characteristics save the hour of operation.

MS. CLARK: Well, I think that's important.

MR. REEDY: But it's small enough -- well, it's

important --

MS. CLARK: If it's blowing at night, is that when your peak is? I mean --

MR. REEDY: Certainly, I would agree with that.

MS. HARLOW: Susan, I also notice that some of the rules that are in in the states that have net metering mention time-of-use rates, and it seems like that might go to your point about encouraging facilities that produce energy when it's truly needed. So I notice one rule, and I'm sorry, but I've forgotten the state it was in, required anyone that was receiving net metering to also be using time-of-use rates. So if they were getting a full retail rate, they would receive more if that energy was produced during a peak period of time. And I wondered if you had any opinion on that, if perhaps that would satisfy some of your concerns about the cross-subsidization that you spoke to earlier.

MS. CLARK: I certainly think it would address the size of the cross-subsidization.

MR. GRANIERE: Okay.

MS. CLARK: Judy, you brought up a point about some of the states being net metered, and we had a brief chance to go through some of the statistics or information you gave under what states net meter. And I think Florida would qualify as being net metered in the same way other states are, because they purchase -- for instance, Connecticut purchases at avoided

cost at the end of the billing period. And that would be what is done under the photovoltaics here. So Florida should be included.

SPEAKER: Is that Connecticut data accurate? Because they do have net metering for renewable resources in Connecticut where you are credited at retail with CL&P and you --

MS. CLARK: I'm looking at the staff's chart that they've attached.

SPEAKER: (Inaudible.)

SPEAKER: Yeah, the current policy in Connecticut does allow renewables to net meter. It's currently, I think, at 100 kilowatts, and I think they're in the process of increasing that.

MS. CLARK: My point was that Florida should be considered as a state that net meters under the criteria where the excess is paid at avoided cost for the photovoltaics as provided in the 6.065 rule.

MR. BROWN: This is Michael Brown. This is a little bit -- it's not off topic; it's on topic, but it's just taking it a little towards the shoulder. Can we specify that the surplus is defined over or at the end of a period of time, and then if there's a surplus it's carried over? Because as I understand it right now, the way the metering operates is that it shows whenever the meter is actually pushing back towards

the grid on a daily, hour-to-hour basis, and that number is what the surplus is based on currently. That's the way I understand it from the customers.

I don't have Progress Energy. I couldn't tell you exactly, but that's the way it's been described to me from some Progress customers. They tell me that they're getting avoided cost on their daily, hour-to-hour surplus. Let's say at noon, they're not home and their system is generating peak power. And say they push back onto the grid five kilowatt hours of electricity. They're not even home, they're not using it, so they've actually at that specific time period, they've actually created a surplus, according to the meter that they have in there can.

And, like I said, this is what has been described to me. I don't know for sure if this is exactly what's happening, but this is what someone told me is happening, is that for that five kilowatt hours that they -- during that particular time of that day, even though they are still not overall making a surplus, they're still only -- they're only getting credited the avoided cost on that five kilowatt hours. So what I'm saying is that their consumption is way beyond that.

MS. CLARK: Uh-huh.

MR. BROWN: But they're -- so, basically, they're almost paying a wholesale rate for the electricity they've generated. You don't understand?

MS. CLARK: No. I mean, I'm looking at the rule, which is 25-6.065, and it specifies that the value of the generation shall be credited to the customer's bill based on the host utility's COG-1 tariff or other applicable tariff. And for those utilities, and there are two of them that actually record the time the generation is being provided, it gets credited at that hourly avoided cost. For the others that don't measure it at the precise hour, it gets averaged cost -- average hourly cost.

SPEAKER: (Inaudible. Microphone off.)

MS. CLARK: Which one?

SPEAKER: (Inaudible. Microphone off.)

MS. CLARK: The two that do actually measure the hours are Gulf Power and Tampa Electric. The two utilities that use the average hourly rate, both of which are allowed by the Commission's rule, is FP&L and Progress.

MR. REEDY: I have a question, I guess -- Bob Reedy -- for either Susan or staff.

We keep discussing the COG-1 as being avoided cost. And my understanding has always been that's as-available. Could we get a clarification of that?

MS. CLARK: Yeah. COG-1 is as-available.

MR. GRANIERE: As available.

MR. REEDY: Okay. But we've been talking -- we've been mixing avoided cost with as-available. And that's a term

that --

MS. CLARK: Well, as-available is avoided cost for the energy. Now, if you're talking about avoided cost having to do with capacity, yes, that would be a different issue.

MR. REEDY: The term I'm referring to is in the statute, 366.091, and it says full avoided cost, which in my experience has always been full avoided cost. In other words, but for that generation, what was your cost for that hour? Now, whether it's hourly full avoided cost or average full avoided cost, is another delineation. But I just would want to be clear that when we talk about COG-1, I don't see that as avoided cost.

MS. CLARK: Yes, it is avoided cost for energy. I think what you're sort of mixing is the notion that you get as-available when you can't -- the capacity isn't actually committed and available to the utility when they need it. It's whenever -- you pay as-available because there's no commitment as to the capacity.

MR. REEDY: And just to further on that comment, then, if the capacity is predictable and known, is there any difference between that capacity credit and a credit with a contract that --

MS. CLARK: I think that you've hit on the real issue. Is there a guarantee that the capacity is going to be there or is it predictable?

MR. REEDY: That's a fair question, and it can be dealt with, because of the -- you know, the characteristics of the systems. Again, as long as we're not talking about reciprocating engines or something else, as long as we're talking about PV, we have a well-behaved system that we can talk about. Actually, in line with what can be done with negotiating a firm purchase, you know, it's firm, but it also can fail. And there are penalties to pay when it fails, that sort of thing.

MS. CLARK: I think, getting back to his point about the credit, and this deals somewhat, Judy, with the question you asked about using current meters and is it just a billing issue? One of the factors that -- I can't answer that question for you today with complete confidence. It depends on the period over which you net bill.

Now, I think as provided under the rules, the net billing is done on a monthly basis. That's part of what has to be decided in any net billing arrangement is over what period do you net bill.

MR. GRANIERE: Okay. Bob Graniere.

Susan, the way I understand what the thing that -- the part that you referenced to, that part had to do with the net excess, which was something that occurred at the end of the cycle, whatever it happened to be. So let's say it would be at the end of the 12 months. There was like -- there was a credit

that had been banked. Okay. And you ended up at the end of that time, right? That was what was paid anywhere from zero to the wholesale rate to something else. But as for the banking or credits that were carried over from month to month for a 12-month period, they were paid at the retail rate.

Okay.

MS. CLARK: I'm sorry. In where?

MR. GRANIERE: In all of these things. Wherever you see paid at the wholesale rate, that only refers to what credits are left at the end of the period.

MS. CLARK: Let me just be clear. You're saying in this chart that you provided that when it says avoided cost, it means that at the end of the year they pay avoided cost?

MR. GRANIERE: Yeah. Yeah. If there's any credit left at the end of the year. So what that would -- and how that differs from my understanding of the way the Florida system works is that if there were a credit at the end of the year -- well, there couldn't be a credit at the end of the year, actually, unless you carried it forward. But what would happen is that the credit as it's carried forward is credited not -- the value is not credited at the retail rate; it's credited at the as-available rate, which is less than the retail rate. So, as a result, the payment is less than what's normally in a net payment rule. And so as a result it's sort of like a situation -- in fact, during the lunch period I went

to my house because it's close, and was talking to my wife about this. And, basically, the idea was something like this, is that during those hours that you were talking about where I was sending stuff to the grid, I sent it to you, and this is it, and you paid me four cents for it. And then a couple of hours later, you sent it back to me, and you charged me ten cents.

And, so, you know, and said, well, why is that fair? And I think that's a question we need to answer. Why is that fair? Because when you think about it in that very simple terms, you know, when I sent it to you, you gave me four; when you sent it back to me, I paid ten.

MS. CLARK: Because there are other costs in that --

MR. GRANIERE: I know, and that's what we need to get to, you know, as to why that's a good thing and why that's right.

MS. CLARK: And it depends on when you generate them.

MR. GRANIERE: I know. Those are all of the things that we have to get to.

MS. CLARK: Bob, this is Susan again.

I'm just a little confused, because as I read this chart it does seem to say that it is the avoided cost, at least for some of them. It says, Texas, it says, purchased by the utility monthly at avoided cost. And isn't that what --

MR. GRANIERE: Yeah, that would be -- yeah, that

would be one of those.

MS. CLARK: Under this. So that Florida would be considered a net metering state for photovoltaics.

MR. GRANIERE: Yes. As long as the -- and that's what I was saying, it all comes into the definition, and that's what we're trying to get to. We're trying to get to -- that's why we asked the question, you know, basically, what should the compensation be at the end of the billing cycle and during the billing cycles, and that's what we're trying to get to.

And we know what we already do, and we really need to get down and sort of work it out so we know if we really are on a net metering scheme like other people describe it, or do we need to get to a different net metering scheme. And if we do go to a different net metering scheme, what are the benefits, what are the costs, why is it a good idea and not a good idea.

We just need to look at it, you know, again, and because we're in a different environment than we were, you know, five, six years go. And it's just a matter of just looking at it again to see where -- you know, where we're going, and if there is a need to go. I mean, the general thinking is, like if you just looked at the general thinking of it, is that net metering generally means to most people, the common sense definition, is that the -- is that the credit that's carried forward is credited -- the value that it's credited at is retail. And then there's a question as to what

you do at the end of the billing cycle. That's sort of like a common sense -- what most people think of when they hear the term net metering. That's what most people think of.

And so now, you know, that's just what -- you know, that's just what -- that's like, you know, common usage. That's what most people think of. And now we just need to think about whether the common usage is what is a proper thing to do here in Florida. I mean, I think it's really almost about as simple as that.

MR. WALLACE: I'd like to also make comment. Wayne Wallace.

Taking a look at what, Mike, you had brought in here on this -- on this net metering here developed by Volt Solar, there is also some sources here from Pacific Gas and Electric. I don't know if anyone has had a chance to read this three -- it's actually a four-page document, but on the last page they certainly show where all of these -- all these footnotes come from. You know, National Renewable Energy Laboratory, Pacific Gas and Electric, you know, government, federal information. I mean, the bottom line is, from what I read out of this, and this dovetails and parallels what Bob Reedy at Florida Solar Energy Center showed on his grid thing up here, you know, showing how that collapse happened. Distributed generation, specifically PV, provides benefits to all grid users. Now, that's a good service to the public people in Florida. That's

really the bottom line. And, I mean, I really would almost like to read this whole thing, but I know everybody has it here.

You know, basically, net metering, distributed generation provides economic benefits for all utility customers. And as photovoltaics produce the most electricity during peak demand period, the benefits of net metered solar systems are magnified. Well, then they show this study here from Pacific Gas and Electric, and then they show, you know -- well, actually what Bob Reedy was saying, how if you can match generation with load, you've got a real good system.

Well, peak demand reductions, properly oriented PV systems, can produce electricity that closely match the use of air conditioning loads, thus reducing peak demand. Well, PV systems, if we can net meter these and reduce peak demands, those are good for the public. Ultimately, in the long run, they're going to be good for utilities. I've even seen the CEO of Pacific Gas and Electric, how green that company is, how good a corporate goodwill of a green footprint is for their investors and how they are the world leader --

(Tape change.)

MR. WALLACE: -- energy in this whole country, Pacific Gas and Electric, so how they've changed around their whole thought pattern. And the whole process hasn't taken, certainly overnight, but they are leaders.

You know, if we look at what we do in the PV industry and what Germany has done, what Japan has done, the little bit of PV that we do in Florida now -- of course, they do a lot in California, Maryland is coming on, New Jersey is on, New York is here. All of these products that are purchased, they come from Germany and Japan. Well, I think we don't want to be left here in the wake of their development and all the technology they are moving forward with.

Getting back to this report, avoided generation fuel cost. Each kilowatt generated by PV systems displaces other utility generated on peak when fuel costs are highest, thereby reducing costs for all utility customers. That's good for the public service.

Avoided transmission and distribution upgrade costs. Because solar power is located where it is consumed, it can help avoid or defer the need for new power lines. Installations in load pockets maximize this value. That's good for the public service.

Avoided transmission and distribution losses. Since distributed generation solar power is located at the point of use, line losses, typically seven to ten percent are avoided. It says here: Note that losses are significantly higher during peak demand periods when solar is at its maximum production. This function further multiplies the other benefits described in this list.

Fuel diversification. Solar, with no fuel costs, provides a hedge against volatile fossil fuel-driven electricity costs. That's another good service for Floridians.

Avoided water cost. Competing generation sources use tremendous amounts of water, an increasingly scarce and valuable resource. Of course, that's in New Mexico, but we still have that here.

And then the environmental benefits. Of course, this is a whole lengthy -- I won't get into reading all of that. We all know the environmental benefits of solar power, net metered solar systems, you know. We are going to continue to have solar power until the end of time. When we no longer have solar energy, none of us are going to be here anyways.

The economic benefits from job creation. I kind of touched on that earlier. Look at what they're doing in Germany. Look at what they're doing in Japan. I mean, we really need to have some net metered renewable energy systems. I don't think we should have any cap on it.

We have a particular customer right now, a woman that has done very well manufacturing some things. She wants to put in a 17 kilowatt system in her home. Her home is 15,000 square foot. Her electric bills are probably going to be 500 to $800 a month. If she puts in a 17 kilowatt solar PV system, how much is it going to save her, $3,000 a year? I don't think we should have a limit on the size of a residential system. If

somebody wants to do the right thing and generate clean power and help other Floridians with some things we just mentioned here. And there is so much good stuff in here. What's not amazing is it, basically, matches what Bob Reedy has stated on his presentation. It's good for Floridians. It's good for the public.

MR. GRANIERE: Mr. Wallace, I -- Bob Graniere.

I don't think anybody in the room is going to try to say that solar is not good. I think everybody agrees that solar is good. I think what we're talking about here is, to some extent, its expense and also to how compensation is going to occur.

In my younger days, I would have blurted out something that I won't blurt out at this time. But all I've got to say is that's a pretty big house. I mean, that's all I've got to say is that is a pretty big house. A lot bigger than my 1,200 square foot apartment. I'm just pointing that out. And my 517 kilowatt hours that I use per month. So maybe somebody should give me a payback for being such an energy conservation type fellow, and I should like sort of maybe on my nonexistent Florida income tax should get a tax credit, perhaps, just because I'm a good guy.

But, in any event, I think that what we really want to talk about here is how do we -- you know, try to compensate it and who should be eligible and how we can get this thing

going forward. And I do agree with you that everything is -- you know, it's very good. It's very good, yes. It's clean. It's an unlimited source of power, yes. It's like wind, yes, it's unlimited; the solar, yes, is unlimited. You're absolutely correct that if the sun goes, so do we.

And that's one of the reasons why energy gets special treatment, because energy is an essential service, no doubt about it. You could take -- we could do away with almost everything except two things. You can't do away with water, and we can't do away with energy. And that's just the way it is, we can't do away with that. If we do away with water, we're dead in seven days. If we do away with energy, we're dead maybe in three months. But in either event, we're dead. So, yes, we're right. You're right.

But, you know, we're not talking about that. We're talking about how we're going to -- who is going to be eligible to get the -- you know, to get net metering and why and how much should it cost and what do we need to do, you know. But I do appreciate the fact that it is a good thing.

SPEAKER: Bob, I'd like to, on that point of what should apply, I'd like to -- I've had some time to think about Susan's earlier comment about small wind, and that's correct, I think that's a problem. The focus we've had is on PV, and we're so sure of ourselves because we match that peak, that utility peak so well, everything works out. It may or may not.

And since it may not, I think it might be wise to keep that out of our consideration.

MR. GRANIERE: Okay.

SPEAKER: It's also convenient that it's probably not an issue in Florida, so that might save the wrath of some of my wind friends with that regard.

MR. GRANIERE: Okay. We have a Question Number 11, and we just went through 10, about customer size restrictions.

Eleven is that this has to do with the vintage of the renewables. And the simple statement is if there's a renewable already installed, should it get net metering if we went to net metering paying retail rates, or should net metering only apply to new installations?

MS. HARLOW: I have a question on that. I know that in the past with the Commission when we brought up the issue of incentives, we always had this issue of vintages. I know that we had a particular commissioner who always said that the vintage was immaterial, because even if you had an existing system, you would need additional investment to keep that going over time. And I'm wondering if that applies to solar systems as well. What kind of financial input do you have to put into these systems over time to keep them going?

Because if you get to a point where the system needs a new inverter, or whatever, the customer will have a decision, again, whether to keep that system going. So maybe somebody

from the solar industry could give us a picture of kind of ongoing costs to keep the systems operational.

SPEAKER: I could make a comment there that, you know, there's an old saying that to the pioneers go the arrows and to the settlers go the land. And these people that pioneered these systems and paid a lot more money in the early days, goodness gracious, they certainly deserve to get net metering if it comes along.

And I can't speak for everybody in the solar industry, but I always try to use technologies that came from companies like General Electric, Shell and Solar where I felt the solar panels would there be for a long time. But a lot of the early inverters, especially the ones five or six years ago that we had, you know, probably might have to be replaced or dealt with over a period of time. But I think it would be really unfair to these people who paid a lot more for their systems a few years ago and, you know, went through all the early phases of this not to be rewarded for their pioneering efforts.

MR. GRANIERE: Thank you. Yes.

MR. JONES: Jeremy Jones.

I think tomorrow we will probably be talking about the technical requirements in order for a system to be interconnected to the grid, which I think is where vintage will come into play more. Is it up to the specifications required

to safely connect? And then if it is, why not -- you know, why would we make rules against them being able to net meter. So I would encourage it to ride with the interconnection rules, not the net metering rules.

MR. GRANIERE: Okay.

MR. REEDY: Bob Reedy with a comment. Since my theme is always equity, rather than so much incentive or subsidy, I would say that it becomes a moot point. If it's what the value of the capacity and energy warrants, then it should be paid. And if we're taking the position that this is an incentive, or a subsidy, or a cross-subsidy, then it raises all kind of other discussions that are valid, and there's a reason for society to do all that. But I suggest that if it was analyzed and looked at as generation and with certain characteristics that it would be just an equity or parity issue, and that would be moot.

MS. CLARK: Bob, I would only -- this is Susan Clark.

I would point out it depends on what you're trying to accomplish by the net metering. You know, if your purpose is to encourage new resources, then you might vintage. If it is to encourage a certain type, and for some it already exists, but you want to encourage them to stay on as producers or people that offset some of their energy use, you might not want to vintage.

MR. GRANIERE: Okay. Bob Graniere.

So would it be fair to say that when we discuss this

issue or look at it, we need to pay particular attention as to what we hope to accomplish through net metering, I guess?

MS. CLARK: I think it's true for all the issues. What is the purpose you're trying to achieve by the net metering rules.

MR. GRANIERE: Okay. Okay. Moving on to technical issues. And here's something I know absolutely nothing about.

Why are the technology restrictions important to include in a net metering rule? I mean, are there some types of technologies that are particularly not suited to net metering while others are for technical reasons?

MR. BROWN: Michael Brown. It depends on whether it's actually a grid interconnection rated inverter. As far as the net metering goes, you're dealing with peak load issues which is what Susan was bringing up earlier. If the equipment is rated, which goes into interconnection agreements more than it applies to net metering.

MR. GRANIERE: Okay. So the answer is --

(Simultaneous conversation.)

MR. BROWN: The technology restrictions are already in place as far as being intertied with utilities, being utility grade for PV. Well, for interconnected inverters. That's a whole industry.

MR. GRANIERE: Okay.

SPEAKER: Are you saying that the technological

restrictions are already handled through the fact that they can't interconnect?

MR. BROWN: Correct. And one of the issues Bob Graniere brought up earlier was, you know, why don't people just go down and by a five kilowatt generator and hook it up to the grid and everything else. Well, any of the utilities will come by and basically shut them down and turn them off, because they'll wreak havoc on the grid. At their point of connection where these two incompatible wave forms hit each other that aren't in sync or anything else, it would be a really ugly scene. So that's already something that is not going to happen.

And there is intertie agreements anyway. Before anybody is going to be recognized for any kind of a rate structure at all or an intertie agreement, they're going to have to enter into a specific intertie agreement with the utility anyways. And every utility has that somewhat in place. Even if they haven't used it, most utilities have something on the books.

MR. GRANIERE: Mr. Lane.

MR. LANE: There is a type of technology we haven't mentioned yet that Honda has developed a type of gas generator that if there is natural gas lines, they can come on and generate power through a generator and send it back into the grid. And they especially advertise it for use, you know,

during peak demand with the utilities as a time of use sort of thing. It's a technology that they're using in Japan. And, you know, a lot of utilities here like Gainesville Regional Utilities, for example, sells gas and electricity. This could be something very advantageous to the utility, but in some areas the gas lines are separated from the utilities. But this could be very advantageous in the production of peak power. It might be something we want to think about now.

MR. GRANIERE: Okay.

MS. CLARK: Bob, this is Susan Clark.

It wasn't completely clear to me what that question and the next one were -- I think the next -- no. Well, A, that you were driving at. Are you talking about technology restrictions regarding the ability to interconnect or are you talking about technology restrictions as to the type of renewable we should be promoting?

MR. GRANIERE: Well, I was thinking more of the -- I think what we were thinking was more of the technology restrictions that we would include in a net metering rule, which would basically say something as simple -- I mean, I think the simple way was, are there any types of renewable resources that are not eligible for net metering for technical reasons?

MS. CLARK: For technical interconnection reasons.

MR. GRANIERE: Reasons, right. Or the intermittency

or whatever we're talking about.

SPEAKER: Do we also want to talk about which ones we don't want to include for policy reasons?

MR. GRANIERE: Nope.

MS. CLARK: Just so I'm clear, this particular question was --

(Simultaneous conversation.)

MS. CLARK: This particular question is just driven by the interconnection issue?

MR. GRANIERE: Yes.

MS. CLARK: Okay.

MR. GRANIERE: So we could -- we could defer this to the interconnection --

SPEAKER: That was going to be my --

MR. GRANIERE: Okay.

SPEAKER: -- question, slash, suggestion is that it really is interconnection.

MR. GRANIERE: Okay.

MR. JONES: I have a follow-up question on that, then. So if tomorrow it's determined that they should -- I'm sorry, Jeremy Jones -- that they should allow small wind interconnections, where does that place that wind generator in terms of net metering? Did we already decide that that's not included?

MR. GRANIERE: Well, if the issue is is that the

reason you can't be net metered is because you can't be interconnected, if you can be interconnected, then you can be net metered, it would seem.

MR. BROWN: This is Michael Brown. I think the question Jeremy is raising is that if we leave the meeting today without coming up with some kind of also a net metering agenda for wind, which is different from solar -- Susan has also said that wind could blow at night, which could run into an issue. So, I mean, maybe we should look at a size constriction for other renewables that are not specifically at peak times.

MR. GRANIERE: Bob Graniere. I would think that that would have been a really great idea if some of those other guys showed up, but they didn't. And you all are experts in photovoltaics. And so the other guys didn't come, they just didn't come, and we don't know what to say, because they didn't come.

MR. BROWN: Fair enough.

MS. CLARK: Bob, this is Susan Clark. That kind of brings up a point that we would like to have clarified, and that being that the two issues aren't tied together, that there are interconnection issues that may need to be resolved or looked at for a whole host of generation types. That doesn't mean that they should be eligible for net metering.

MR. GRANIERE: That's correct. Yeah, that's correct.

You would -- we would think, at least the staff thinks at the present time that the net metering rule should apply to all sources of renewables as defined in the statute. And then the question is who should be eligible for streamlined and who should not, right? Whereas, the net metering doesn't necessarily apply to all types of renewables that are in the statute. I think that's the simple way to --

(Simultaneous conversation.)

MS. CLARK: In other words, not every renewable that is in the statute should be eligible for net metering?

MR. GRANIERE: Yeah. And that is necessarily eligible. They're not taken off the table, but they are not necessarily eligible, and that's what we're trying to get at. Whereas, the interconnection, on the other hand, they all have to be eligible for interconnection, and then the question becomes which ones are eligible for streamlined or expedited interconnection versus the longer and more tortuous interconnection agreements that people are always so happy to enter into. So I'm glad I don't do that.

MS. CLARK: Thank you for that clarification.

MR. REEDY: Bob Reedy with kind of an understanding at myself, the chain of reasoning that leads me to say it's an equity issue to take PV roughly at retail rate doesn't necessarily hold with these other technologies. And so I would not -- I'm not in a position to support that, and I can

actually, as a utility engineer, think of issues with induction generators that don't have the value proposition than an inverter based system, especially one with storage. And there are other technical reasons that would not warrant the value assigned, the retail value.

MR. GRANIERE: Okay. Question 13 has to do with -- there's a lot of the agreements that are currently out there, and there's a lot of talk about there are some safety requirements placed on certain renewables that are connected on the distribution side, something about (inaudible).

SPEAKER: (Inaudible).

MR. GRANIERE: Yeah, whatever they call that word, yes. And, you know, tripping over wires and stuff like that.

Are there any safety requirements that are placed on what are currently either net metered or dual metered customers that would not be placed on other customers and why? Like me.

MS. CLARK: Yeah.

MR. GRANIERE: Yeah.

MS. CLARK: Because they are putting power back into the grid.

MR. GRANIERE: And that's the only reason?

MS. CLARK: Well, I guess -- yes, because you need to be able to isolate them and disconnect them in the event of emergencies or maintenance. It's not like you and I are putting power into the grid. I mean, if that's what you mean

by other customers, is those who are not producing electricity.

MR. GRANIERE: Isolating and -- just let me ask one more question, and then I'll let you talk. Are those same safety requirements applied to an IPP? Are they?

SPEAKER: Yes.

MR. GRANIERE: Yes. Okay.

MR. LANE: Tom Lane. I'd like to make a comment on that.

MR. GRANIERE: Okay.

MR. LANE: All of these units are not only IEEE, but UL approved. In fact, they are approved to the point that we produce better power than the utility companies do from the inverters that we use. But all of these things are under UL approval like every other appliance in the home, which has to do with fire and safety codes. One of the things that's sort of onerous to me in this thing is the fact of having to have an AC disconnect when we already have a DC disconnect to disconnect the system from the grid and shut it down, plus the inverters won't even work if the grid isn't up.

And the last ruling was that the utilities can require an AC disconnect, which is not part of the National Electrical Code, but does add quite a bit of cost to the unit. And I've personally experienced at my own office when a limb came down and hit the line and the utility guy came to the place and had to disconnect. And I had a huge label right

there on the meter saying, you know, there is an alternate disconnect and it was one foot away from him. The guy didn't even touch it or do it. He just pulled the meter can right out of the wall. So the meter can is already one disconnect and all systems require a DC disconnect that's there also.

So this AC disconnect can, you know, require a lot of cost to the homeowners, especially when they have to run this back, all the way back to the utility meter. So that does present an issue of cost. And most utilities in California have gotten away from that, said that isn't even needed, don't even bother with it anymore. And it does add a lot to the cost.

MR. GRANIERE: Anybody else?

MR. REEDY: Bob Reedy. The safety issues really are well-addressed by IEEE 1547, which is not just PV, but does include PV. And Tom Lane made a good point about the AC disconnect. That is the conventional means the utility uses to disconnect a home. It can be locked and rotated or -- you know, it can be lockable, as well. That's how utilities cut off nonpaying customers. So that is a point where we at the center have noticed that many states from many jurisdictions don't require that and for that very reason.

MS. HARLOW: Susan, this is Judy. I notice that our current rule, 25-6.065, allows the utility to require at the customer's expense a manual disconnect to be installed. Do you

know right now if the four major IOUs are requiring that? And if you don't know today, if you could let us know, I'd appreciate it.

MS. CLARK: Unless they can tell me right now. I think some of them can and maybe some of them need to check.

Judy, we can provide that information to you.

MR. GRANIERE: Okay. Anything else?

MR. BROWN: This is Michael Brown.

Just to reinforce what Bob and Wayne said, and Tom, that it is, it's just redundancy. And the utility already has a means to lock out the system. And in order to be code compliant and meet NEC, it has to be an islanded inverter anyways. And these inverters operate within -- I think it's like six milliseconds of disconnecting themselves from the utility. It's a fail-safe means. No one is going to get shocked. They will not operate without grid presence.

MR. GRANIERE: Well, without grid presence means?

MR. BROWN: It means that there has to be a hot end. And not only does the hot end -- the specifications for the inverters are also such that they have to operate within certain parameters. If the utility -- now, I've seen -- I had a customer call me up and say my system is not working. And it was a grid problem. It was not his system. If the grid is not operating within certain parameters within a certain frequency and within certain voltage parameters, the system won't work,

either. There are very high techs -- this goes on towards what the cost issues are.

MR. GRANIERE: Okay.

MS. CLARK: Bob, this is Susan Clark. I just want to be clear. What I have heard is that for safety reasons, that the IEEE inverter needs to be used for these systems, and there is no disagreement that that should be required.

MR. REEDY: Agreed.

MR. GRANIERE: Okay. So now what I'm hearing is that the -- what dispute there is on this has to do with the AC disconnect?

MR. BROWN: Yes. Because, in effect, by having the meter, the utility has a means of disconnecting and locking out the customer if that's what needs to happen, or if their concern is a large safety concern. You know, like say, a tree comes down and takes a pole out in front of somebody's house, and they see that it has a PV system on the roof. If they just want to do a fail-safe, they can always cut the little ring lock, pull the meter, turn it, put it back in, put the cover on, put another ring lock on it.

MR. GRANIERE: Okay.

MS. CLARK: But that requires them to go out there and manually do that. Whereas, this safety --

SPEAKER: Oh, the islanding on the inverters is there regardless.

MS. CLARK: It's automatic?

SPEAKER: Yeah. I would not suggest anybody ever try to co-generate with a utility with a non-grid tie inverter. It's a very bad idea.

MR. REEDY: In fact -- Bob Reedy, with a comment. The real problem if you go out with the crews after a storm is that these quiet Honda generators are so quiet, and people do use double-ended plugs and cause a real safety hazard there, because those are not, of course, inverters. They're not designed for this anti-island business. In the old days, you know, the generators were pretty loud. And the line crew can't listen anymore and tell whether there's -- but that's not a problem with any type of IEEE 1547 device.

MS. HARLOW: And that is in our interconnection rule for larger QFs that -- and I'm sorry, I don't have the number with me right now. But it references the utility tariff on interconnection, and says that the utility should, as part of its tariff, include the standard that must be followed. And I wonder if that's something that if we did change our existing small PV rule or did a net metering or interconnection rule for renewables, small renewables, if we should require the tariff to list the appropriate standards, and maybe that would give more certainty to the utility and to the PV people that everybody was playing by the same rules.

SPEAKER: Absolutely. I would think that's the

consensus. It needs to be kept up to date, too.

MR. GRANIERE: Okay. Well, I guess -- Bob Graniere.

Are there any other types of customers that have these AC disconnects, other than somebody who has a distributed generator on their site, or anything like that?

MS. CLARK: I have understood we all have AC disconnects, that you pull out the meter.

SPEAKER: That's the point. That's the point.

SPEAKER: (Inaudible.)

MR. BROWN: Yeah. Everybody has an AC disconnect. Because if you don't pay your bill or if they want to turn off the electricity to your house because of an unsafe condition, it's at their will to do it. And it's for their linemen's safety. So, I mean, yes, everybody has a disconnect means, but the external lockable disconnect that you're talking about, no, that's strictly a renewable energy co-generation requirement that is dictated by the utility.

MR. GRANIERE: Okay. So that answers 14, too. Okay.

MS. CLARK: Bob, this is Susan. I just want to be clear from the industry. They believe that the IEEE requirement should be met.

MR. LANE: The AC disconnect is not an IEEE, nor is it a UL, nor is it a NEC requirement. However, if you're requiring us to put this redundancy in, which most utilities now are eliminating, then we have to put it in the NEC code.

And my point is how is the lineman going to know that a PV system is there? It's not making any sound, okay. If he sees it there on the roof, he could just go simply and pull the meter out of the box. Which I mentioned in my case he did, even though the AC disconnect was two inches away. That was familiar with him, that's what he knew to do, that was simple for him, and he pulled it out.

MS. CLARK: Just to get clarification on it, it doesn't seem to me that you disagree that the AC disconnect should be there?

MR. LANE: I do disagree, because we've got a DC disconnect on the system. The inverter will not work. You already have an AC disconnect, and you can pull the meter out. It's not required by IEEE. It's not required by UL. It's not required by the National Electrical Code. And it does add a lot of expense to have to put one of those in and put it within, you know, six feet of the utility meter when we put them in. We have to put them in within six feet of the utility meter, if we do put them in.

MR. GRANIERE: Okay.

MS. HARLOW: Can someone give us a feel for the expense?

MR. LANE: Well, the expense is usually as much as 100 to $150. But one can become an expense, even cost as much as $1,000, if the circuit breaker box is all the way on the

other side of the house. That means we have to take the TV tower and run it down through a DC disconnect, and then you have to run it all the way over to the utility meter and put in an AC disconnect, and then maybe run it 100 feet back in the house to where the power panel is in the house. And, you know, that can be an enormous cost.

Now, if somebody is building a house, and I can coach them up on it, I could say, okay, you know, just put your meter -- I mean, your power panel right behind the AC disconnect. It could vary tremendously in what it costs, a few hundred dollars to well over $1,000 in running electrical wire. As I mentioned before, most of the -- they don't require it in Germany. They've never had an accident there. They don't require it in Japan. They've never had an accident there. And most of your California utilities are saying to get rid of it now, don't bother with it.

MR. GRANIERE: Okay. Susan.

MS. CLARK: Bob, there may be other reasons to keep it. For instance, if you have a customer that is generating, and for whatever reasons they're not keeping up the insurance on protecting the system, you may still want them to get electric energy, be able to provide -- take the energy from the grid, but not provide it back into the grid. So you would want that separate, the ability to cut off the one and not the other.

MR. GRANIERE: Okay.

SPEAKER: Pull their meters right then.

MS. CLARK: But if they're still going to get energy from the grid, you wouldn't want to pull their meter.

MR. GRANIERE: Okay.

SPEAKER: Well, you just said they weren't operating safely.

MS. CLARK: If you wanted to simply disconnect the generation part and not the part that gives them energy from the grid.

MR. GRANIERE: That sounds like that's one of -- that's an insurance issue.

MS. CLARK: The circumstance that caused that was an insurance issue.

MR. GRANIERE: Insurance issue. Yeah.

MS. CLARK: Certainly, this is an issue we can further information to you on.

MR. GRANIERE: Okay. The final question in this section is we hear a lot about advanced net metering. You know, the meters that do all those wonderful things. Do we need that kind of infrastructure to do net metering, or can we do net metering without those smart meters?

MR. BROWN: This is Michael Brown. Net metering can be done with any meter. Some utilities like to monitor different aspects of what is happening. They like to see time

of day. You know, they might want to remotely meter the system. Net metering can occur with practically any kind of meter. There is a type of meter that is being distributed to customers, non-renewable customers that will not register anything going back. So that is important. It does have to be a meter that will allow for some type of measurement of backfeed.

MR. GRANIERE: Okay.

MR. REEDY: Bob Reedy with a comment that a single meter is all that's required to net meter. Because, as I started out in my comments, you know, net is net. But, certainly, some of the -- there's a lot of value, potential value today and potential great value in the future in knowing the generation of the PV system. And though most inverters have some type of meter built in, it's often regarded that it would be appropriate to have a utility grade meter at that point, so that if there was a trade in green credits or any other type of incentive based on the generation of the system itself, you don't want to blur that in and merge that in with consumption of the home, that that would be available. So the suggestion that we put forth is that even if you are in a net metered scenario, it's a good idea to put a $32 socket with a blanking cover on it in line with the inverter so that that can be done later without having to do any rewiring.

MR. GRANIERE: And what exactly would that do?

MR. REEDY: That allows you to plug in a utility grade meter if you have a reason to do it. For instance, you're aggregating. Maybe the utility is buying green credits from the PV generator or an aggregator is buying green credits. That way there is a meter that is acceptably traceable to the Bureau of Standards, and you have the socket for it, you don't have to do any electrical work to install it.

MR. GRANIERE: So then I would presume that in that scenario it would be the person who owns the PV system that would buy that meter?

MR. REEDY: Correct.

MR. GRANIERE: Okay.

MR. REEDY: It would be their choice to also not put in the socket. It's just a recommendation that we make because it's so very little cost and almost zero labor because you're there wiring the system anyway.

MR. GRANIERE: And so that meter and that socket is not required to do net metering?

MR. REEDY: Not required to net meter. And I hope that's very clear.

MR. GRANIERE: Okay. And so, also, am I hearing also that those -- it's not required to have the infrastructure in for those meters that do all those things in addition to measuring kilowatt hours?

MR. REEDY: It's not required. A simple meter, as

was pointed out, if it's the type that has -- call it detent (phonetic), that is a problem. There's an option on most watt hour meters that you can specify a detent so that if the customer turns the meter over -- most meters if you turn them over, they'll run backwards and subtract. So that's sort of a theft prevention thing. And that detent would be a problem to a net meter, which is a good point that was made.

MR. GRANIERE: Okay. And then the final thing --

MS. CLARK: Bob.

MR. GRANIERE: Okay.

MS. CLARK: Just to add to that, we would agree that there are meters that don't run backwards. But whether or not advance metering is needed would depend on the rate the net metered customer is on and the way payments for the delivered energy are calculated. If they are to be on a net excess hourly and pay hourly under the COG-1 rate, you do need advanced metering.

MR. GRANIERE: Okay. I knew we would get to you. The tariff and how the compensation works would depend on the metering, right. Okay.

Now, just one final question on the net metering -- I mean on the advanced infrastructure. Is there anything about the current advanced metering infrastructure that would prevent net metering?

MS. CLARK: Bob, this Susan. Not that I'm aware of

at this time.

MR. GRANIERE: So you'll -- could you get back with us to say yes or no on that?

MR. BROWN: This is Michael Brown. If I could -- say they have the meter that will not read backfed electricity, could we have some kind of a time frame in order for the utility to replace that with an acceptable meter?

MR. GRANIERE: Well, I think that, you know, since we are working here right now in hypothetical, you know, are we going to change, are we going to do this, are we going to do that, we're gaining information, I think that particular issue would be reached after we make a decision as to what -- well, after the Commission makes a decision as to where it wants to go. But it would seem to be sort of a problem if there's a whole bunch of new advanced metering stuff in there that can't do net metering, but we want to do net metering, and now what do we have to do to make it work? That would, of course --

MR. BROWN: Well, even if --

MR. GRANIERE: -- be interesting, to say the least.

MR. BROWN: This is Michael Brown. Even if we're not net metering, even if we're getting the avoided cost, if it won't read backwards, you're not even getting that.

MR. GRANIERE: Yeah. And like I said, we just need to find out if there's any problems to begin with. It's sort of like a threshold issue and just to see what happens on that.

It's just a threshold issue. And then if it is an issue, the question then becomes what do we do to fix it, assuming that we want to fix it. And then we'll need discussion, because I just don't know how that would work out.

MR. REEDY: Bob Reedy with a little clarity.

I mentioned the detent. There is also a design of meter that either mechanically or electronically senses that it's upside down and actually doesn't stop the meter, it just keeps running in the forward direction, no matter which way you turn it. So I just wanted to be clear that there are all kinds of things there for the theft prevention.

MR. GRANIERE: Okay. I think it's time for a break, at least my head hurts. And so how about a ten-minute break?

SPEAKER: You're upside down?

MR. GRANIERE: Yeah. And then we'll get to the financial and rate issues.

SPEAKER: Are you running backwards?

(Recess.)

(Tape Change.)

MR. GRANIERE: Okay. It's late in the day, everyone is getting a little tired. Too bad. We have to keep on going. And besides, now we are at the really important stuff. Money. We're going to talk about financial issues and rate issues, and this is like the really important stuff. So it's always good to keep the important stuff for last, because this way we all

stay interested. Okay?

So we do have something we can talk about. The first thing is these insurance requirements. Some people, I'm sure, will argue that they don't need insurance requirements. If there's no safety issues, why do we need an insurance requirement and what exactly does an insurance requirement do? What is it that's actually being insured against?

And I guess the normal situation would be, I would guess, if someone wanted insurance against something, it was the people who want the insurance against something that normally pay for it, right? But here it seems that it's the person who is buying insurance for somebody else, or am I wrong? So why don't we start on that one. What's being insured against and who's paying for it?

MS. CLARK: Bob, this is Susan.

It's my understanding that it is liability insurance. And for the small photovoltaics it's 100,000, and it is to cover the cost of any liability cost of anything that might occur resulting from the operation of the generating equipment.

MR. GRANIERE: Okay. So your understanding is that it's the -- it's the owner of the photovoltaic system that's buying the insurance against --

MS. CLARK: To protect utility customers.

MR. GRANIERE: To protect themselves against harming -- if they happen to harm the utility customers? Is

that basically what happens?

MS. CLARK: It's for the purpose of holding the utility and the utility customers harmless for accidents and acts that are the result of the generator doing something or not doing something.

MR. GRANIERE: So it's sort of like car insurance?

MS. CLARK: It is like a car insurance for liability insurance.

MR. GRANIERE: Yeah. Okay.

MR. BROWN: Michael Brown. Most homeowners or people with mortgages already have the required insurance. It's already there. But people that own their own homes sometimes forego that level of insurance, which is what they are worried about, and that would, like she said, cover the liability issues for line workers and/or equipment on the line side.

MR. GRANIERE: Okay. So it's normally taken care of if you have a mortgage, but if you're fortunate enough to actually have paid off your house, you may not have that. So should they have it?

MR. BROWN: It makes everybody happy. And, I mean, it's general homeowner's liability insurance. So, I mean, it's something that you should have anyways for your own protection. But to co-generate -- like you said, we could argue back and forth as to how safe the systems are. I think it would show goodwill towards everybody if a homeowner was responsible

enough to carry that level of insurance in the first place in order to co-generate.

MR. GRANIERE: Okay. So let's make believe you're a homeowner that has enough insurance -- that owns their home and you have the photovoltaic system, would you buy that type of insurance?

MR. BROWN: I would probably have that level of insurance to start with. If that was a requirement to interconnect, and I was stubborn about it, I would make sure that I had a PV system that I could turn off from the grid and run isolated, stand alone myself. So, I mean -- Tom has a question.

MR. LANE: I've had two customers that had no insurance on their home. And they decided -- you know, to connect to a utility they had to get liability insurance. There is sort of a history that goes back on this when some of the major IOUs basically tried to stop interconnects by using that as a bogus red herring of requiring the homeowner to have massive amounts of insurance, which the Public Service Commission overruled in the initial connection.

Personally, I don't see any need for it whatsoever, because there's a liability to the contractor who puts it in. There's also the situation of the equipment, if it malfunctioned, there would be a liability against them, also. And what would stop a homeowner from operating a generator

illegally? And are you going to require somebody that doesn't have liability insurance for their home -- because somebody could operate, which would be far more detrimental to a utility company. Personally, I don't see any need for it.

MS. CLARK: Bob, two points with that. You know, I think the point about operating something illegally should not be the standard for deciding if you should have the liability insurance. Secondly, the notion that the contractor or the homeowner would still be liable doesn't mean the money will be there to cover the liability. That's what insurance does for you.

MR. GRANIERE: Okay.

MS. HARLOW: Susan, this is Judy. I know in our current small PV rule, interconnection small PV rules, that's where we have the $100,000 liability requirement. And I think in our interconnection rule for larger QFs, for QFs -- I might have to refresh my memory, but I think it's a million-dollar coverage there. I'm wondering what's going on with the systems in between those two? For example, if a homeowner today wanted to interconnect a 15 kW system, they would not have the current small PV rule available to them. And what's going on with insurance there for those customers?

MS. CLARK: Judy, let me add that to the list of things to get back to you on. And I seem to recall that the insurance was most recently addressed in the standard offer

rules. You might be correct, it is a million or two million, but you're interested in those systems that fall in between. Okay.

MS. HARLOW: I think if you could give us a picture of -- if you could give us a picture for how many of these systems exist that are relatively small, customer-owned PV systems that are interconnected, but were not interconnected as a result of the small PV rule. In other words, they were put in before 2002 when the rule was in place, or they are larger than the 10 kW requirement for the rule.

MS. CLARK: Just so I'm clear, are there any small systems that exist that are larger than 10 kW and not --

MS. HARLOW: Correct.

MS. CLARK: -- photovoltaics and what the insurance requirement is on them?

MS. HARLOW: Looking at photovoltaic systems greater than 10 kW and what is the insurance requirement on those? Also, while you're at it -- sorry to be giving you homework -- but if you could give us a picture of the rates, how are they being metered and what are the rates that they are being paid for any excess energy that goes to the grid. We'd appreciate it.

MR. WALLACE: This is Wayne Wallace. I have a comment.

When I have contacted the utilities to get

information on systems larger than 10 kW, I was sent their QF information, which, again, I found that in some utilities, you know, it's extremely lengthy.

MR. GRANIERE: Okay. The next question has to do with just general fees and charges that should apply to a net metered customer. In this case being a photovoltaic because that's what we're talking about. So far we have talked about insurance, and so far we've talked about the safety requirements and those costs. Are there any other fees or charges that photovoltaics get that other customers don't get?

SPEAKER: There have been some utilities that have required hookup fees. Originally the first two I put in the utility required $250 for each one. But they've since quit doing that.

MR. GRANIERE: Okay.

MR. WALLACE: This is Wayne Wallace.

I'd also like to add some utilities we do pay a fee for the utility interconnection. It's like $100. So somebody has to pay that. I mean, it's either -- we usually take care of it for our customers, just so we try to make things smooth and easy for them.

MR. GRANIERE: Okay.

MR. BROWN: This is Michael Brown to follow up on what Wayne said. For Progress, I think it's a $95 application fee. And I have two customers -- did you get your? Were yours

credited back to your bill?

Yeah. So they were actually refunded that back on their bill. So if you're covering that charge, Wayne, I think you might want to see if you can get that money back.

MR. GRANIERE: Okay.

MR. WALLACE: I just felt as though it shouldn't be a fee at all, you know. There never used to be a fee, and then all of a sudden there was a fee. So I don't know if -- you know, I certainly think that there shouldn't be. And our customers were certainly downtrodden when we told them there was a fee. And we just said, look, it's -- I mean, ultimately they're paying for it. You know, if we're paying it, we have to pass it along to them.

MR. GRANIERE: Okay. I have a question for the solar people. If I were to ask you what percentage of the costs of a system are related to fees -- I mean, if I were to say, okay, you know, you're installing a two kilowatt system, and I think you mentioned it was $8,000 a kilowatt, and so it would be $16,000. I'm trying to find out, out of that 16,000 how much of -- what percentage of it is fees and charges and stuff like that?

SPEAKER: Not including building fees, are we talking directly utility-related fees?

MR. GRANIERE: Yeah.

SPEAKER: Just utility-related fees?

MR. GRANIERE: Yeah.

SPEAKER: It's less than five percent. Probably like two or less.

MR. GRANIERE: Two or less?

SPEAKER: It depends on whether the utility requires additional equipment, also.

MR. GRANIERE: Three hundred and twenty bucks?

SPEAKER: Somewhere in that range.

MR. GRANIERE: Okay.

SPEAKER: On average.

MR. GRANIERE: Okay. Have any fees been missed, Susan?

MS. CLARK: I'm not aware of any.

MR. GRANIERE: Okay. Now, one of the things -- the reason I -- you know, the reason we're asking that question is that we had heard a lot about fees and trip wires and things that were holding this stuff up. But sometimes it's nice just to find out how much we're talking about, you know, and is it really a barrier or is it one of those things that are not quite that big. We just needed to find out, you know, what that was.

Now, to get back to the insurance. How much does that insurance cost?

SPEAKER: May I just go back to the last question? Residentially, we don't have any real fee problems with the

less than 10 kW, but I don't know how this relates, but it is big. Systems over 10 kW, there is, you know, a whole list of obstacles, so we have huge, huge trip wires there.

MR. GRANIERE: And they are -- and they are?

SPEAKER: Well, I have to take a look at the qualifying facility arrangement on a system over 10 kW. There's fees upward to $80 per month. There has to be inspections. The insurance requirement, I think it's 500,000 or a million dollars. I've seen one utility with like a 33-page document, and I have heard that another utility's is over a hundred-page document. So just to review it and read it, and it's written by attorneys, so it's very complex.

MR. GRANIERE: Okay. So if I heard you right -- and that presumably is an interconnection document?

SPEAKER: (Inaudible.)

MR. GRANIERE: Okay. We'll deal with that tomorrow, as for the, you know, the interconnection document itself. But what I'm interested in, and what we're interested in is just trying to get a sense of for the total installed cost for this system, how much of it is related to administrative and otherwise type work. You know, if it's small, it's small; but if it's big, it's big. But we need to know what it is. We can't continually just talk about it one way or another. And it would seem that the people who put the systems in and pay the fees would know how much this costs, because it's part of

what they do when they give a quote out. And if we don't know the insurance -- I'll ask you. How much do you pay for the insurance?

SPEAKER: (Inaudible. No microphone.)

MR. GRANIERE: For the $100,000 liability?

SPEAKER: (Inaudible. No Microphone.)

MR. GRANIERE: Okay. It's included in there? You don't have to pay any additional?

SPEAKER: (Inaudible.)

MR. GRANIERE: Okay. Okay. So, basically, it's actually no additional cost is what you're saying? Okay.

SPEAKER: (Inaudible).

MR. GRANIERE: But you have a mortgage. If you didn't have a mortgage, how much would you pay?

SPEAKER: (Inaudible.)

MR. GRANIERE: Twelve hundred bucks. Okay. So there, that was easy. Okay. So the cost is 1,200 bucks if you don't have a -- at least we have a sample of one. So the cost is 1,200 bucks.

MS. CLARK: Well, Bob, I don't think you can make the assumption that people only carry that insurance if they have a mortgage.

MR. GRANIERE: I understand.

MS. CLARK: Okay.

MR. GRANIERE: I understand. I was just, you know,

just trying to get a sense for, you know, what's going on. And, also, you know -- Susan, I mean, all we are doing there is sort of getting an upper boundary that basically says if a person were to buy insurance only for that reason, it would cost $1,200. If their fees were for a two-kilowatt system was $320, then we could say that the absolute maximum administrative type stuff is $1,500, which is -- you know, and then you put that over 15,000, and you say, you know, it couldn't possibly be more than 10 percent. You could say things like that.

SPEAKER: Bob, just to be accurate, as accurate as we can get with this type of estimation, when you quote the $1,200, that's for a full homeowner's policy, which only a portion of which is that liability portion. So if you were just looking to get the liability, it would be somewhat less than $1,200. I would say considerably less than $1,200.

MR. GRANIERE: Yeah. You know, no, you're absolutely correct. I mean, all I was doing was giving the absolute maximum if that's what you paid at the absolute total max, and it was only for that reason. Because I think everybody agrees that that $1,200 was for more than simply that. But, you know -- but no one can sit out there and say, well, just for that is some number less than 1,200.

So if I -- so if no one can say what the number actually is, I'll just work with the number we have and then go

from there. So we know we have an absolute large number, and that's -- so it can't be more than 10 percent, at least from the information we've got right now. So on a $16,000 system, the fees and insurance can't be more than 10 percent.

MR. JONES: This is Jeremy Jones.

Has the point been taken that it's not real significant on the under 10 kW systems, but it's very significant above that?

MR. GRANIERE: Well, we can't say it's very significant above that, because all we have right now is the statement that it is very significant, but we don't have any information that says it is very significant.

MR. JONES: Okay. Well --

MR. GRANIERE: In other words, you don't have any -- but, like I said, the solar people are the people who do that. So you all can probably provide that information and let us know how significant these things are. Because you do it, and we don't.

MR. WALLACE: Pardon me. Wayne Wallace. If we wanted to provide that information to show the significance of that above 10 kW, what would we do? Just say here it is, here's the document that this utility needs, here's the document that this utility needs. And should we just forward that if we wanted to bring that to your attention?

MR. GRANIERE: Well, I would -- you know, what I

would think is that the statement being that it is significant, and if significant means a lot of money, I would sort of put together a hypothetical that, you know, deals in average behavior and says on average for a system of this size, which is greater than 10 percent, these are the fees and insurance and stuff that we have to factor into our price, so that we know -- so that when we look at it, we say, okay, this is what it is, and get sort of a sense. I mean, it would be kind of surprising if the absolute maximum for a 10 kW system was -- I mean, for a two kW system the maximum was 10 percent of the installed cost.

And it might make a really big difference if we found out that the absolute maximum for a 25 kW system was 30 percent of the installed cost. I mean, that would say -- then that would at least lead me to say why? You know, what happened going from 10 to 25 that meant the fees had to go from 10 percent to 30 percent. I would just ask that question. Why did that happen?

Now, it's also possible that the fees can go from 10 percent maximum on a residential unit to seven percent on a larger unit, because of the additional high cost of the larger unit. And then I'd say, well, geez, that's actually not very significant, because they're not, because the other one was 10 percent, and this one is only 7 percent of it. But, you know, we need to know that. And you just can't -- you know, that's

what we need to know.

MR. WALLACE: So, again, if I wanted to get that information to you, just mail it to you or --

MR. GRANIERE: Oh, no. You don't have to mail it. You could e-mail it.

MR. WALLACE: Just e-mail?

MR. GRANIERE: Yeah.

MR. WALLACE: E-mail it to you?

MR. GRANIERE: Yeah, that's right. You know, and then we put it in the record. And there will be a -- you know, I mean, the lawyer -- what do you do when that happens? I mean, when you get information like that from people?

MR. HARRIS: As I said at the beginning, we don't have an open docket at this point, so I guess Bob will collect it all. At the point when we get ready to open a docket, which is usually when we have a rule draft, we'll go ahead and file it all in there, and it will all be in the docket file then.

MR. GRANIERE: Okay. Yeah. Yeah, that would be a way to do it.

Okay. So that takes us on to -- we already did the who should pay for the installed additional equipment. And now we get to the really big one, cross-subsidization. Who wants to start the debate on the cross-subsidization if the PV customer were to get retail rates?

MS. HARLOW: Can I make a comment?

MR. GRANIERE: Sure.

MS. HARLOW: It's obvious to me that we have a lot of competing interests in the room. I think everybody agrees that photovoltaics are a good thing. There is apparently some disagreement on how do you incent customers to put that in. Is net metering necessary or not?

But Susan did mention earlier that there's a cross-subsidization concern. And what I wanted to ask her was -- this is just an assumption, but if we assume that the Commission wanted to go in the direction of paying retail rates for these small -- what's limited to small PV systems, what kind of conditions could be put in the rule that would protect other customers who do not have these systems from paying what could be considered excess cross-subsidization fees?

And that wasn't very eloquent, but I think you know what I'm asking.

MS. CLARK: Well, I think net metering by its very nature includes -- if it is net metering where you net it against what they're putting in, it does include a subsidy by its very nature. That they are not paying -- they're getting a credit for their generation at a full retail rate. And the retail rate includes in it other costs, not just generation costs.

MS. HARLOW: That's correct. But these are relatively small systems we're talking about, and so we're not

talking about a lot of money. And so what I'm asking is what other qualifications could we have in a rule? For example, we talked earlier about time of use rates being required. I believe we also had someone who mentioned the strip heats on the heat pumps and there being some requirement that they would have some kind of controls on strip heaters so they would not be inflicting as much of a demand issue on the utility.

Because the utility does still have the obligation to serve these customers. And what I'm trying to figure out is a way that you could get net metering to incent these customers to install systems; and yet at the same time limit the other customers' exposure.

MS. CLARK: Judy, I think you have -- the things that you have named would limit the subsidization that would occur from other customers, and those are appropriate areas to consider. As you pointed out, North Carolina requires the time of use rate, so that it assures whatever you're putting into the grid you're not paying at a higher rate, that it is a comparable switch of power or however you want to say it. But that does help with that issue. So you're not consuming power when it costs more and generating it when it costs the utility less.

So, yes, those items that you have enumerated would mitigate the cross-subsidization issues. And as you point out, I guess the magnitude of the cross-subsidization depends on how

you limit it as far as technology, the cap on the size of the unit, and that sort of thing. And it would be the IOUs' position that it is appropriate to consider those ways of mitigating the cross-subsidization.

MR. HINTON: Susan, this is Cayce Hinton. Judy is a lot smarter than me, so she jumped right to the solution part of the equation. And I would like to find out and just clarify what your actual cross-subsidization concerns are. Where do you see cross-subsidization, so that we can discuss whether everybody agrees that that's a concern or not. And then if it is, we can talk about a solution to it. But I just wanted to clarify what exactly you see as the problem.

MS. CLARK: Well, first, it's inherent in the net metering that you credit at a retail rate for generation when the retail rate includes costs other than generation, things needed to maintain the infrastructure to deliver the power. It would occur again when you -- for excess generated power if you pay more than the avoided cost, that would again result in cross-subsidization, because you are paying higher than avoided cost for the power. And then if you do not require the customer to pay for those additional equipment, or additional billing, or other administrative costs that are incurred because of the net metering.

Now, having laid out those areas of cross-subsidization, the issue then becomes for some other

purpose is it appropriate to allow that cross-subsidization to occur. That's what we're suggesting you need to look at as you determine the direction you want to go in net metering.

SPEAKER: (Inaudible.)

MS. CLARK: Right.

MR. GRANIERE: Okay.

MS. CLARK: If this is a public good that people should be paying for in that way.

MR. GRANIERE: Let me see if I could -- at least for my own help, sort of bring this down so I understand it. The statement was, was that the retail rate includes things other than generation.

MS. CLARK: Yes.

MR. GRANIERE: Okay. And those things would be the generation not including its fuel. Okay. Just the carrying cost on the actual generating unit, right? That would be the transmission and the distribution, right? And then the fuel?

MS. CLARK: No.

MR. GRANIERE: No?

MS. CLARK: You have administrative costs, you would have customer costs.

MR. GRANIERE: Okay. So we have administrative costs and customer costs. So we have overhead, too. Okay. All right.

And then anything else?

MS. CLARK: I'm looking for my notes on that. I think that is the basic sort of universe of how they're categorized.

MR. GRANIERE: Okay. So would it be correct to say that when power is given back to the grid or the distribution network and then resold back again to someone else, that there was no fuel involved?

MS. CLARK: It would be fair to say there are avoided generation costs.

MR. GRANIERE: Yeah. So there would be no fuel, right?

MS. CLARK: Okay.

MR. GRANIERE: Okay. And would there be any transmission involved?

MS. CLARK: Yes, because the transmission has to be there to provide service when they are not generating themselves.

MR. GRANIERE: Right. But if there is growth it would be there anyway.

MS. CLARK: No.

MR. GRANIERE: No? Okay.

MS. CLARK: I still think --

MR. GRANIERE: So growth doesn't count.

MS. CLARK: I mean, I think where we disagree is that when you size the transmission and the distribution, because

you cannot rely on that generation to provide that power, and it is an interconnected grid, you must size the transmission and distribution to accommodate the power that would have to be generated by the utility to reach that customer. It is not an avoided cost.

MR. GRANIERE: Okay. So I think what I hear you saying is that the fact that the power is sold back and put into the distribution system what's -- they still have a base rate charge, is what I hear you saying.

MS. CLARK: I would not characterize it as base rate charge. They still have costs that remain despite the generation from the customer.

MR. GRANIERE: Sure. And those would be the base rate because the fuel is pulled out of the base rate. Am I right?

MS. CLARK: The base rate has in it more than -- it has some of the generation costs that would be avoided.

MR. GRANIERE: Sure. And it has the -- it has the generation capacity, but it doesn't have the fuel. So like when I look at my bill from Tallahassee, what I see is about five cents base rate and seven cents fuel -- or eight cents fuel, I forget -- which, of course, is a good deal, because coming from New Jersey, I saw ten cents fuel and seven cents base rate. So it's a little bit higher there.

But the fact is, is that when this stuff is sold in

and then sold back, there's no fuel burnt, I would think. And so since there's no fuel burnt, then that's obviously a cost that doesn't have to be recovered, because there's no fuel burnt. So that would only leave us down left with the base rate, which is what you're saying is including the generation, transmission, distribution and overhead costs. But that's being recovered only on the grounds that that has to be in place to meet their needs in case you don't generate.

But if that's the case, then it would seem to me that there would be no need for a standby charge, because you're already paying the standby charge through the fact of what you're getting back from the net excess to the grid, because you're saying the reason that you don't give the retail rate back is because you need to have all that stuff in place in case they had to serve you, which is really the definition of a standby charge.

MS. CLARK: Let me say it another way, too, Bob. It seems to me that the avoided energy charge that you are paying is essentially the fuel charge that you're talking about. When the utility doesn't have to generate it, they will pay the renewable generator or any generator the avoided cost, and that is your fuel cost. By allowing them to have full retail rates, you're paying more than the avoided cost, which is the infrastructure and everything else that would go into base rates.

MR. GRANIERE: Okay. I'm understanding that, and so -- but what I'm saying, then, is that under that scheme it would seem, at least to me personally, that there is no need for a standby charge.

MS. CLARK: The standby --

MR. GRANIERE: So what I'm saying is it's either pay the retail rate or don't charge a standby charge.

MS. CLARK: Well --

MR. GRANIERE: Because you're already getting recovery for the stuff that you need to provide the standby, because that's the base rate, and that's the infrastructure that says that's what you need to get the stuff to people.

MS. KUMMER: Bob, can I take a stab?

MS. CLARK: I think you're confusing standby rate and retail rate.

MS. KUMMER: Can I take a stab at that? When we set rates, you assume a certain number of billing determinants. That means if this customer doesn't pay his share, just because somebody else pays his share, you're still missing that piece, because he was included when you set the rates. You've got one less customer contributing to base rates.

MR. GRANIERE: But the customer is contributing to base rates, because this person is not off the system totally. This person is on the system and is still drawing power. And it's not like this person has completely and totally

displaced their draw on the system. So --

MS. KUMMER: But when rates are set, you assume certain kilowatt hour usage. And if he uses less kilowatt hours --

MR. GRANIERE: Yeah.

MS. KUMMER: -- he's paying less to base rates.

MR. GRANIERE: Yeah. And I can understand that, but, you know, we can talk about it, and it's true. But I think we'd all agree that rate setting is an art and --

MS. KUMMER: Oh, certainly.

MR. GRANIERE: -- as much art as science, and as for being able to account for every kilowatt hour, especially when it's projected, means we're probably not right. So if it's lost in the noise, it's lost in the noise. I mean, it's just one of those things. You know -- I mean, whenever you use projected numbers to get things, you have noise, and noise is noise.

MS. CLARK: Bob, I see it as being different. If it's noise, that's one thing. If it's what you're basing your theory on, that would not be true.

MR. GRANIERE: Well, no. No. All I'm simply saying is that there is a recovery for infrastructure, and that infrastructure is there to support power in case these people are not doing what they said they were going to do, and so they are paying for that up front, or is that not the case? I mean,

is it not the case that that's what they're doing when they only get the fuel back and don't get the base rate back? What are they getting by only getting the fuel back and not getting the rest of it back? What are they getting?

MS. CLARK: They're getting the avoided cost of providing generation to the grid.

MR. GRANIERE: I know. And that's on the utility's side. I'm asking what are they getting? For the power that they generate, what are they getting? It may not have much value to someone else, but it certainly has value to them. So what are they getting?

MS. CLARK: Bob, I think what you need -- this is Susan again.

I think what you need to remember, that if they are not paying for the infrastructure to provide service when they draw it from the grid, somebody else is paying for it.

MR. GRANIERE: Sure. But when they draw it from the grid, if I'm wrong, when they draw from the grid, they pay the retail rate. So they're paying the retail rate when they draw from the grid. Okay. When they are not drawing from the grid and selling back to you, right, you being the utility, they're getting the avoided fuel cost, essentially, and then -- but then when they buy that power back or someone else buys that power back that you already gave to them, they pay the retail rate, which means the base rate showed back up again.

So who's recovering the base rate from their power? It's obviously not them. It's obviously the utility because they're getting it when they sell it back. So I'm saying what is I don't see the subsidy here, and I don't see the cross-subsidy here, unless you can tell me that there is something here. I just don't see it.

MS. CLARK: Bob, this is Susan again. I think that Connie has hit on the point, is that when rates are designed, they include the prediction of how much energy you will use so that your retail rates will cover the cost of the infrastructure to serve you. And when you do not use that much of it, then you're not recovering the cost of that infrastructure.

MR. GRANIERE: Okay. So then I guess if that's the point, then I guess the way you fix a problem like that is you just go and redo your billing determinants and factor in solar people.

MS. CLARK: And redo the rates.

MR. GRANIERE: Yeah, then redo the rates. Yeah. Factor in solar people and redo the rates. Wha-la, you're done.

MS. KUMMER: And that's the way to mathematically fix the problem, but that results in higher rates to people who don't have solar and who are not benefiting from the solar.

MR. GRANIERE: Well, you know, I guess --

MS. KUMMER: And that goes back to Susan's point. If it's a social good, and the Commission decides it's a social good that everybody ought to pay for, that's one thing. But from a pure cost basis, that's a different argument.

MR. GRANIERE: Well, from a basis that says that -- that says no one should do any sort of renewable that will raise someone else's rate is what that standard is. No one should do any sort of -- no one should do anything that should raise somebody else's rate is basically what it boils down to. And that is, I think, the fair -- the simple definition of the RIM test. You know, no one should do anything that raises somebody else's rates. So I guess there's a lot of social engineering going on there. Just an observation on that.

So, you know, I'm not sure. I mean, you know, that's a policy we like 100 percent. Yes, that's a Commission policy. That's what their current policy is now. Will it change? Maybe. Maybe not. I don't know. But we're really not talking cross-subsidy here. We're talking something else.

MS. CLARK: Bob, this is Susan Clark.

MR. GRANIERE: Because we know that we can't really -- we know from economics a long, long time ago that when you deal with average rates, talking about subsidy and cross-subsidy is sort of like a lot of fun, but doesn't really get you very far.

MS. KUMMER: It's a term that we toss around.

MR. GRANIERE: Yeah.

MS. KUMMER: It may not truly be a subsidy in a very strictly defined sense, but it's matter of some people paying more who may not be realizing benefits from it.

MR. GRANIERE: Sure. Absolutely.

MS. KUMMER: You can call that a subsidy or you can call it something else, but that's why --

MR. GRANIERE: Right. And you know -- and I understand that. And so, you know -- and so, you know, if we ever get to the point, or someone gets to the point where somebody decides that things like energy security and fuel diversity, and all that other stuff, has a value, well, then the mathematics change and the accounting changes, right. But we don't know where we are here.

But I was just trying to get a sense for what is the definition of subsidy under its current -- you know, under the current regime, and what I think it has come out to is that whenever one individual does something that may cost someone else to pay more, that involves a subsidy.

MS. CLARK: Well, Bob, just to be clear --

MR. GRANIERE: But they're not paying for what they do, I guess. No one gave you any money for your solar system, did they? I didn't think so.

MS. CLARK: I think the point is that other customers will be paying costs that are occasioned by the net metered

customers, not by themselves. So there is a cross-subsidy going from remaining customers to the net metered customers.

MR. GRANIERE: Well, but the reason they're paying it is because the billing determinants originally didn't include them in their true usage characteristics, but used usage characteristics that otherwise weren't true. So the argument being something that goes similar to this. Basically, the argument is that those -- I'm sorry, I forgot your name. I'm really terrible about things like that. But they were put into the system at 1,000 kilowatt hours, let's just say a month, that's what they were put into to do the billing. But their true characteristics aren't 1,000 kilowatt hours a month.

Their true characteristics are 500 kilowatt hours a month, because they do half of their load with solar. That just happens to be their true characteristics, but they just weren't captured in the rate-making because they weren't put in. So now, basically -- so their rates come out and using the argument that their true characteristics weren't captured, actually the subsidy is going the other way, because, basically, the rates are too low, because their true characteristics weren't captured. But if you get the true characteristics, then all of a sudden -- you know, so what should be the ratemaking philosophy, assume an average rate or try to get people's true characteristics? I don't know.

MS. KUMMER: It works the same way with load

management. I mean, load management assumptions are built into the billing determinant forecast. If you bill the solar reduction into the billing determinants, that would presumably result in higher rates for everybody, including the people with solar energy.

MR. GRANIERE: Sure.

MS. KUMMER: And mathematically that's just the way it works.

MR. GRANIERE: Yeah. And that's just the way it works, and so it's not a subsidy anymore. It's just saying that the true characteristics have been captured, and that's that. Good, you're shaking your head no, so that's good, because then we're going to get some discussion on this one. I knew that was going to happen.

SPEAKER: I'd like to make a comment in regards to this that if you talk to the utility customers, they overwhelmingly support solar and overwhelmingly support net metering. Now, maybe the investors in the utility company might have an objection, but the customers themselves overwhelmingly will support solar energy and the use of net metering.

And we've all talked about how good, you know, solar is and the good benefits, but coal definitely has a detrimental effect and it kills people from the time it's mined until the time it's burned. And you can directly trace infant death

syndrome, emphysema, people being admitted into hospitals by the increase of particulates. So the benefit to everybody's health of not releasing mercury and despoiling the biosphere --

(Tape change.)

SPEAKER: -- I think most customers understand that.

MS. CLARK: Bob, this is Susan Clark, and I'll just make this comment, and then I think maybe you and Connie can hash it out as an explanation of rate design. And I can say, maybe you'd invite me to see that, but --

MR. GRANIERE: Oh, yeah. That would be fine. I invite all of you to come in and see it.

MS. CLARK: I think the point to be made is that if you are going to spread a fixed cost over less billing units, it's going to be a higher rate for that billing unit.

MR. GRANIERE: Absolutely.

MS. CLARK: So, you know, you're going to increase --

MR. GRANIERE: Yeah. And all I'm saying is that a higher rate doesn't necessarily say anybody is being subsidized. It just says it's a higher rate. If there is a legitimate reason for a rate to go up, it says it's a higher rate. For example, let's make believe that we're not in Florida where we've always been growing, and let's make believe we're in Michigan, or Indiana, or some of those places up there where load is running away and jobs are going away, and all that other stuff, but the only thing that's not going away is

the fixed charges for the utilities.

And so off they go, and they set their new rates. And, wha-la, the new rate becomes higher. Is anybody saying they're subsidizing anybody? No. They're saying the rates are higher. That's what they're saying.

MR. BROWN: This is Michael Brown.

I just wanted to bring one thing up, because I promised that I would, and this goes towards wording the rule while you guys are working on it. And the concern was the definition of a commercial system. And commercial systems should be a consumer commercial entity, not somebody getting into a PV system with the intent to commercially sell the electricity.

MR. GRANIERE: And I think we've -- you know, we've really talked about that, and I, you know, have heard it from several people that net metering should not be applied to someone who doesn't -- who does not pass the test that they're not an IPP.

MR. BROWN: Yes, sir. It just came up during the last break, and I promised I'd say something.

MR. GRANIERE: Yeah. And I don't -- you know, I think that's been discussed and talked about. But it doesn't -- still doesn't reach to the issue, at least as far as I can see it yet, and I'm sure other people see it differently, but I know on the cross-subsidization -- I understand the RIM

test and I understand the argument. And I understand that it's possible for a person to pass the participant test and fail the RIM test. I understand that. And what that says, as I understand it, is that it says that the participant did good, but the ratepayer base didn't. And so -- and that's what I understand that to mean.

But I'm not sure that that means that the ratepayers as a class are subsidizing anybody. It just means that they're not doing as well as they could have done if these other people didn't decide to do what they did, which was, presumably, to do something that they thought was a good idea, I would think. Otherwise, they wouldn't do it. Right? Okay.

So, you know, that's -- so, I mean, I -- and that's just the nature of putting those two tests together, the RIM test and the participant test. Obviously, if we chose, instead of the RIM test, we chose a total resource test, instead of that, we'd have a totally different situation. And then what's being called a subsidy would just be called bad luck. I mean, you know, that's what it would be called, and that would be that. So I just don't -- I mean, I understand, you know, the argument, but I'm just not -- but for what it's worth, I'm not convinced yet, for what it's worth.

MR. REEDY: Bob, I'd like to comment now. You know, I've --

Bob Reedy, excuse me, for the record.

I've been around the rate process for many years. I fully believe in it. And for that reason, I really don't accept that there is a subsidy to other ratepayers, you know, in the direction. I think you might have mentioned in passing there that there could be a reverse subsidy. And I'm now convinced after looking at this that that's probably going to be the case when the analysis is restructured and done. I think the subsidy issue can easily be looked at in two macro ways.

The first one is through this same ratemaking process the utilities have filed time-of-use rates. And so, in essence, what they're saying is for that seven months of the year, or whatever it is, during the same very time of the day that the PV systems are producing, there's no doubt that all issues, not just energy, but the demands on the capacity, it happens to be the hot time of the year, so transformers overload quicker and lines overload, transmission overloads, capacity -- capacitants is, reactants is down. I'm using technical terms. I apologize. But those are the very times that through the whole process, the utilities are very happy and have said, okay, I'm selling -- I'll be happy to sell you at this rate because that's what it costs. And then at the off-peak, I'll charge you a much lower rate than the middle-of-the-road average retail rate.

So if you do that macro view, that's to me a very

strong reassurance that as a PV interest person, I would be saying, let's go with it. You know, let's do the ratemaking. I think it will end up in the noise. I truly believe that. But I think the numbers will point in the direction of a subsidy from the PV generator to the rest of the rate class.

Secondly, a macro way to look at it is every hour that this is going on that utility is in the wholesale market. It's either buying or selling, and rarely at a neutral point. And, of course, that's very competitive information. But historically -- it can be looked at historically, not in, you know, current time, but historically that is very revealing about the value of that pseudoenergy that we mentioned, you know, it goes and comes back. It actually just goes to your next-door neighbor and offloads the distribution system.

So I'm a firm believer in the rate process, but I just don't accept that, oh, well, just because there's less revenue -- I mean, less units, variable units sold to this party, that that means that everybody else in that rate class is going to pay more. And that's in addition to the other benefits that I've been talking about that, you know, could, with good penetration, can avoid insulation of capacitants and solid state transmission control equipment and other things.

MR. GRANIERE: Yes.

MR. JONES: Just to expand on that a little bit. PG&E was mentioned earlier, and if you look at California as an

example, and they are the most mature solar market in the U.S.

Again, Jeremy Jones, sorry.

They've realized -- PG&E in California has realized that the power at those times is so valuable that they have a special rate available to solar operators where they will put you on time of use and give you over 30 cents per kilowatt hour for energy generated by your solar rate during those periods, because it's so valuable to the grid and to the state and to the ratepayers. So that's going far and above the retail expectation and hope that everyone, I think, has here, but just a good benchmark.

MR. GRANIERE: Yeah. Yeah. Everybody -- ratemaking, you know, is sometimes cost-based, other times it's value of service, and sometimes it's policy driven. We can't here at this place deal with policy-driven stuff, and value of service at the present time is, I don't think, the Commission policy, if I'm correct, and so it is a cost-based argument. And we just need to right now work within that and fully understand it. And then see if there is a need to talk about something different, presuming that maybe the Commission wants to move in a different direction. But, you know, I do understand that.

I mean, I have a fair bit of international experience in the fact that Germany charges -- gives five to seven times the rate. It's good for them, but that's (inaudible). You couldn't get more of a policy decision, you know, if you looked

for it. And Germany is far from in a great situation on these issues. And a lot of this stuff they are doing there is because they -- every time the Ukraine and Russia pick up about natural gas getting from Russia to Germany over the pipeline that goes through the UK -- I mean that goes through the Ukraine, most of Europe has a meltdown for a couple of days to try to figure out what they are going to do.

And so when you're in that situation, paying a premium to get more renewables up and running is not all that bad an idea. But I hardly -- I'm just -- this, of course, is just my opinion, but I don't think we hiccup -- I mean, we react with hiccup quite that bad. So, you know, it's some kind of multiple like that, you know. It may not be right for here. But, you know, we need to take into a little bit more than just the notion of what another country is doing in some places.

I also spent a little time in Japan, and I understand why they give a lot of stuff to renewables, especially because they have to import every fuel that they use. So energy security to them is, you know, has risen to a much higher level than it is here. They realize they can never get energy independence, but they do realize that energy security, which is basically a supply chain, is a problem for them. So, yes, they're willing to pay a premium for renewables that we may not be willing to pay here in the United States. So this stuff is a little bit more complicated than just what some people are

doing.

And I think at this point, it being five after 5:00, and I don't think anybody cares about reporting requirements right now. So I'm willing to say good night, unless somebody wants to talk about reporting requirements.

MR. REEDY: I do have -- Bob Reedy.

I have one thing that was -- early this morning that -- I don't want to open a new can of worms or discussion, but on the jurisdiction issue, it is problematic to the progression of photovoltaics in the state for there to be three sets of rules or potentially more, investor-owned utilities, municipal systems, and cooperatives.

And 366.091, which is, again, talking about -- surely was contemplating larger QF types of installations, but sets out that the standard offer contract -- the terms are really almost the same, apply to both -- to all three classes of utilities. And, again, also, in other places that the Commission has jurisdiction over rate structure is a term we always used to say. And certainly I would consider net metering to be a structure issue. So I would just encourage any proceeding to really try to bring consistency and uniformity in the state to that. That's just --

MR. GRANIERE: So you're basically saying that the rate structure applies to not only IOUs, but munis and co-ops and --

MR. REEDY: It would be my opinion that net metering is a structural issue, at least, among other things, but it is structural. And, therefore, it could -- it could apply. And interconnection is not a rate issue, but I would think that through the thrust of the other statute that speaks towards standard offer contract and turns around and says, you know, municipalities. So they have a little difference for the sovereignty issues of the governing board. But, basically, the terms are all the same in the statute for cooperatives, muncipalities, and investor-owned utilities.

And the industry, not speaking like an industrial promotion, but, again, our charge at FSEC is to look at issues that are barriers to the development of green energy, of solar energy. And that's a big barrier when there's lots of different rules. There's 39 municipalities and, gosh, 15 or something, 12 cooperatives in the state of Florida. Some of them are quite large.

MR. GRANIERE: Anything else?

Thank you. I really appreciate the time you gave me and gave the rest of the staff and the information that you've been willing to share with us. And see you tomorrow at 9:30.

STATE OF FLORIDA )

: CERTIFICATE OF REPORTER

COUNTY OF LEON )

I, JANE FAUROT, RPR, Chief, FPSC Division of Commission Clerk, do hereby certify that the foregoing proceeding was heard at the time and place herein stated.

IT IS FURTHER CERTIFIED that I transcribed the cassette tapes of this proceeding, and that this transcript constitutes a true transcription of the said cassette tapes.

I FURTHER CERTIFY that I am not a relative, employee, attorney or counsel of any of the parties, nor am I a relative or employee of any of the parties' attorney or counsel connected with the action, nor am I financially interested in the action.

DATED THIS 14th day of May, 2007.

Linda Boles /fa

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