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BEFORE THE

CALIFORNIA ENERGY COMMISSION

In the Matter of:)
)
Staff Workshop re Incremental)
Impacts of Energy Policy Initiatives)

STAFF WORKSHOP ON INCREMENTAL IMPACTS OF ENERGY POLICY INITIATIVES RELATIVE TO THE ADOPTED DEMAND FORECAST

CEC Building

1516 Ninth Street

First Floor, Hearing Room A

Sacramento, CA

WEDNESDAY, FEBRUARY 3, 2010

1:00 P.M.

Reported by:
Peter Petty

CEC STAFF PRESENT

Chris Kavalec, Demand Analysis Office
Mike Jaske, Electricity Supply Analysis Division
Seymour Goldstone, Chief Staff Economist

CPUC

Carmen Best

Itron

Mike Ting

Also Present (Via WebEx)

Robert Berman, Berman Economics
Richard Aslin, Pacific Gas & Electric
Tim Vonder, San Diego Gas & Electric
Faramarz Nabavi, RETI Stakeholder Steering Committee

I N D E X

P R O C E E D I N G S

FEBRUARY 3, 2010 1:05 p.m.

DR. KAVALEC: Welcome to the Staff Technical Workshop on the Incremental Impacts of Energy Efficiency Policy Initiatives Relative to the 2009 Integrated Energy Report Demand Forecast. I am Chris Kavalec from the Demand Analysis Office.

And some housekeeping first. Restrooms are out the doors to your left, there is a drinking fountain if you go out the door, go to your right, and then go under the stairs against the far wall. There is a snack bar on the second floor, and in the event of a fire alarm, please follow Energy Commission staff out the doors to Roosevelt Park across the way there.

So this workshop is meant to be technical, that is, that we are dealing with the technical issues related to the Incremental Uncommitted Analysis. The bigger picture policy-type questions, how this forecast is going to be used and so on, will wait until our policy workshop, which is scheduled for February 17th from 1:00 to 5:00 here at the Commission. Comments for this workshop and technical comments on the report, we would like to have those by Monday of next week, February 8th. I think the announcement says February 5th, but we extended that to February 8th. With the announcement and the agenda for the February 17th policy

workshop, we will also be posting a list of questions for stakeholders that we would like to have you take a crack at answering during the workshop.

Okay, we want to get to Itron's presentation on the analysis, methods, results, and uncertainties, as quick as we can, but first Mike Jaske from the Energy Commission and Carmen Best from the CPUC are going to provide some background, so we will start with Dr. Jaske.

DR. JASKE: Thank you, Chris. Okay, so I am just going to give a relatively short background as to how we got into this project. In some respects, this is all in the Staff Report, but since we are not focusing on the staff report, but rather focusing on the Itron report for this appendix, this will just give you a bit of background if you have not yet dived into the Staff Report.

Okay, this is obviously why we need to get to Mr. Ting as quickly as possible, so that I will not stand here fumbling around trying to run this machine.

So, obviously decision-makers are pushing high energy efficiency, goals have been announced as far back as the 2003 Action Plan, and released in various forms and various forums following probably up to current. This is a listing that is more particularly relevant to the issue of what these numbers are and how they relate to Demand Forecasts, and how those both relate to the resource

planning process and a great deal of the staff report tries to establish the background about this. In particular, in what was called the 2006 LTTP Proceeding, the PUC was attempting to make use of the 2007 IEPR Demand Forecast as the basis for determining utility procurement authority. It wanted to deal with additional energy efficiency beyond what was in that forecast, it sort of arose in a numeric way; late in that PUC proceeding, there was a difficulty in actually determining what was separate and apart from what was included in the demand forecast, the whole issue of duplication and overlap, and so the conclusion -- a particular conclusion was reached for purposes of establishing procurement authority, but everyone agreed they wanted to do this in a more analytically satisfactory way the next time around, which I will get to in a second.

Sort of almost going on at that very same time was the PUC's 2008 Goals process, it started with Itron doing things at the potential level for the IOUs, and then helping the PUC in the form of the Goals study, itself, that is the genesis of the model used in this project, the so-called SESAT model. The PUC eventually adopted goals based on that analysis. And, importantly, it is stretching the range of, or the scope of, energy efficiency initiatives beyond just those run directly by IOUs, to run programs to include Energy Commission Standards, Federal Appliance Standards,

and other things part of PUC's Energy Efficiency Strategic Plan that it is not clear what entity will eventually implement.

Broadly speaking, there are four categories of programs, IOU programs, plus naturally occurring standards that AB 1109, so-called Huffman requirements for lighting, and then the big goal eventually. The basic approach that was established by Itron in their support of the PUC for the 2008 Goals Study, the definition of the programs, the design of the scenarios, all of that has largely been continued in this particular project, the emphasis being on re-running the analysis to as carefully as time and resources allow, to determine what is truly incremental about those initiatives.

So in order to attempt to avoid the difficulties of the 2006 LTTP Proceeding, the PUC asked, and the Energy Commission agreed to undertake an analysis of additional energy efficiency savings, focusing on what is, as I said a moment ago, incremental to the base Demand Forecast. We have been working on this now just about two years, and we are finally getting to, hopefully, some payoff.

The Energy Commission decided it was going to do this sort of in two parts, despite recommendations from IOUs to adopt the concept of a Managed Demand Forecast, which is to, say, include these hypothetical policy initiatives directly within the forecast itself, the Energy Commission

decided they wanted to retain its distinction between committed and uncommitted, that it has had since practically the beginning of the Energy Commission's planning process back in the late '70s, and these two definitions help clarify what is committed and what is uncommitted.

So we launched the project with the assistance of Itron, funded mostly by the PUC and, only at the very tail end of this effort by the Energy Commission, to do three things: to upgrade the energy efficiency assessment of committed programs, which would show up in the forecast itself, there has been a lot of discussion of that in the various workshops, and in the 2009 IEPR process; secondly, to develop incremental savings estimates for this range of things that, from the Energy Commission's perspective, are called "uncommitted," but it is not *any* uncommitted, it is precisely the hypothetical programs that were established in the 2008 Goals Study; and then, finally, transfer that capability developed by Itron in-house to the Energy Commission and be able to use that looking forward.

So, I think you are all largely aware of the extent to which we sort of went back to ground zero to re-ground our utility program analysis in the data that was available through the EM&V process in the activities undertaken by the IOUs up to a certain point, and then in the most recent round of program evaluation activities by

the PUC Energy Division, itself. We definitely upgraded what we were doing and, of course, included within those adopted forecasts, the continuation of the very high levels of utility program activity that first started in the '06, '08 cycle, now all the way up through 2012.

So in the particular focus now on the incremental analysis, in order to attempt to minimize duplication overlap and come as close as time and resources allow to truly incremental consequences of the same set of hypothetical programs, we gave Itron a lot of end-use detail and the driving assumptions, economic and demographic, and other things that were included in the final demand forecast. Just as an aside, I have probably been in this position half a dozen times now, trying to describe the schedule for this overall project, and clearly, if you will recall things I have said in the past, we tried to sort of parallel this effort with our own demand forecasting project, that really proved not to be realistic, and so these efforts have largely ended up being sequential, it has the advantage, of course, as Itron using all of the final elements of the adopted demand forecast, but having the disadvantage that, here we are beginning the February 2010 after the IEPR itself has already been adopted by the Energy Commission and put to bed. So, ideally, I suppose in some future cycle, we would want to do this in a time schedule

that fit within the IEPR, but that just simply was not possible this cycle.

The essence of what we are trying to do, of course, is to juxtapose the scenario definitions that were first put together in the 2008 Goals Study with reality, and as time has marched forward, things that were considered part of the goals scenarios are now considered committed and are in the forecast, so obviously they are no longer a contributor to any incremental savings. And so adjusting for that is a simple and obvious step. Secondly, of course, we want to be sure that Itron SESAT analysis starts from all of the minutia of the adopted forecast, and so, as I indicated earlier, we provided a lot of end-use detail to Itron so they could mesh their starting point with the forecast as closely as was feasible. And then, of course, undoubtedly, where there are two significant models and numerous assumptions that could differ, and basic structures of the models, there still was, and perhaps even is, ambiguity about how these modeling constructs fit together and, in the end, there was a mechanism developed that would, in effect, try to assure that whatever those ambiguities, the savings called "incremental" were, in fact, not in the base demand forecast.

These five points are sort of obvious. That is the scope of what has now been produced, a draft staff

report with the Itron document as an attachment, and two other attachments written by the PUC Energy Division having to do with a recitation of the whole PUC goals setting process and what they are today, and then a treatise on how the PUC Energy Division foresees these results being used in the forthcoming LTTP Proceeding.

These are the steps that remain: any clarification of the technical documentation as a result of this workshop and comments, and as Chris pointed out earlier, we have changed the due date to give folks a few more days; the Energy Commission's Policy Workshop, the notice for which came out either late yesterday afternoon or this morning, so that is now announced for February 17th, and it will -- as best I understand -- include both the IEPR Committee and Commissioner Weisenmiller representing the Energy Commission's Electricity and Natural Gas Committee. As a result of that workshop, make tweak the Staff Report, add to, subtract from, its description of the process and the policy issues, transmit that to the PUC, and then, of course, we will all be interested in some focus on the remaining or the next cycle and all sorts of improvements that might be possible for it.

So that is my basic background about how we got from early 2008 to today. So, Carmen, can you give us a little insight into the PUC's?

MS. BEST: Thank you, Mike. My name is Carmen Best, I am with the CPUC and today I am representing Energy Division, but there are several other people from Energy Division in the broader CPUC than are here today, as well.

It has been a very collaborative effort that we have put together to come here as Mike had mentioned, and I just wanted to share a little bit more about the role and the interests of the CPUC in this process.

Essentially, the CPUC and the CEC, and the utilities, have been collaborating going back to the original '04 Goals decision, probably before that, to make sure that the numeric goals that were holding the investor-owned utilities of California are reflective of the available potential in the market, and also that they are achievable, and that they somehow reflect the most recent information that we have on how to achieve those savings, and that they reflect the best available knowledge about what those savings would be. And I think that this is another step in that process to understanding what the impacts are of those savings, and how achievable they are.

In the '04 Goals decision, the Commission laid out a long-term commitment to cumulative goals and, in the '08 Goals decision, as Mike had noted, they took another step in expanding this definition, and also the horizon of the goals out to 2020, and the breadth of the activities that would be

included in those IOU goals, and that is one of the reasons that we are here today, is to discuss the quantification of those impacts over that longer timeframe.

I also wanted to note that this process of essentially calibrating the CEC forecast with the '08 Goals Study to quantify the long-term potential impacts of these activities has been a very collaborative process between the CEC, the CPUC, Itron, and also the utilities through the DFEEQP, as Mike had already noted. But I think that has made the analysis stronger and the results also of greater interest to all parties that have been involved. The outcomes of this study, of course, are very relevant to the Procurement Planning proceedings which will be kicking up this year, and I defer to my colleagues on that, and Simon, who will be leading that stuff, going forward.

It is important to note that the California Public Utilities Commission has called for the numeric goals that are set by the Commission to be used in the long-term procurement planning, and I also wanted to note that there is a precedent at the Commission that the goals have been adjusted to reflect new information over time and, like I said earlier, I think this is another opportunity to further understand what those goals mean and how they can be incorporated into PUC policy to meet our objectives.

I look forward to questions today and, as Mike

noted, I wanted to call your attention to the two attachments that are in the CEC Staff Report, that share both a summation of the history of the CPUC goals and adjustments that have been made to them over time and the policy grounding behind those and, as well, there is a Attachment C that discusses the implications of this study potentially for the long-term procurement proceeding. So I wanted to call that to your attention, as well. And that is all I have.

DR. KAVALEC: And we will now hear from Mike Ting of Itron, who is going to go through the details of how we did this analysis and what the results look like, and what uncertainties we had to deal with.

AUDIENCE MEMBER: Is there anything magical about February 8th for the comments to be submitted? You said February 8th, right?

DR. KAVALEC: Right.

AUDIENCE MEMBER: Because that is next Monday.

DR. KAVALEC: Right.

AUDIENCE MEMBER: Could you change that to the 10th? That might be more practical. This is a lot of new information to try to synthesize and boil down to a few good comments in what would amount, to me at least, in probably half a day of actually being able to look at it.

DR. KAVALEC: Yeah, the idea was to get the

comments in, in time to go through them before the 17th workshop. What do you think, Mike? Another two days? Okay, so there you go, Rick, through Wednesday of next week.

AUDIENCE MEMBER: Thank you. I appreciate that.

MR. TING: Thanks, Chris, Mike. I am Mike Ting, a consultant at Itron. I did the lion's share of the work on this modeling and report, to date. So let's see, the way we wanted to do this, ideally, so this is a lot of material, I see most of the same cast of characters from the working group, but there are obviously some folks that I have not seen before, and I think there are a bunch of people on the phone who probably have not heard this before, but I think what we wanted to do was hopefully get through the entire thing and then have Q&A mostly at the end. So I would just request that maybe keep a running list of your most burning questions. If you really have to interrupt, then I guess that is just the way it will go. I will also -- or if you want to ask me, and I might tell you that I could get to it more easily at the end, and I will try to keep a tally myself. If you do not hear me, please speak up, particularly on the phone.

So this is just an overview of what we are going to do. For those of you who have had the report and had a chance to look at it, it is pretty similar in structure, just briefly, I will review the objectives, I think they

were probably pretty clearly stated already; I will provide an overview of the 2008 Goals Study, which we are going to refer to again and again, so hopefully we will ground people on that study in and of itself because it forms really a major foundation for the work that we are talking about today. I will talk about the approach and the methods applied specifically to this study, highlight some of the key scenario definitions and assumptions, obviously spend some time talking about results and comparisons. I am going to spend a fair bit of time talking about the key uncertainty issues for the sake of transparency and full disclosure, and also just for the benefit of all parties going into the next phase of this, namely the LTTP proceeding. And then, hopefully, do most of the Q&A at the end. And if I get through quick enough, we will have a substantial amount of time for Q&A at the end.

So just to recap the study objectives, they have been stated a couple times. The bottom line, analytically for us, was to produce quantitative estimates of the savings from [quote unquote] "uncommitted" program activities that were included specifically in the '08 PUC Goals Study, and ergo reflected in the current adopted goals, savings from those uncommitted activities that are incremental to the savings from programmatic activities imbedded in the 2009 IEPR forecast. And so we are producing a forecast of

uncommitted savings, not a load forecast -- a forecast of uncommitted savings, and so the savings forecast is then going to be integrated to produce a managed load forecast for the next procurement proceeding.

Now, in order to do this analysis, we had to come up with some key framing definitions that we stuck with for the length of the study, these are the four key ones, I believe that Mike Jaske already defined "committed" vs. "uncommitted," he might not have used the same words as I do, but the difference mainly being committed programs are funded and fully authorized versus the uncommitted programs where funding has not be secured or regulatory oversight actually established. The periodicity of committed programs versus uncommitted programs is also essential, committed programs go through 2012, so this is stuff that is active in the forecast period, so 2008 through 2012; and then the uncommitted program period is 2012 forward, so for this exercise, it is 2013 through 2020. So those two timeframes are important to keep in mind and we show them, explicitly, again when we help frame the results and try to interpret them.

So I am just going to walk through a real brief overview of the '08 Goals Study that we conducted for the PUC. The study itself was essentially a set of scenario analyses, and we were looking at savings potential from a

variety of different programmatic efforts -- IOU programs, State and Federal programs -- and the objective of it was really to come up with a comprehensive assessment of savings potential from not only a variety of mechanisms, but also a variety of perspectives, and I will touch on this again later, but, for example, from the perspective of the IOUs vs. the perspective of society-at-large. And, you know, to be able to broaden the pallet of delivery mechanisms and perspectives, to try to help inform the PUC Goals Study process as best as possible.

The analysis itself was designed from the beginning to leverage as much of the detailed data analyses that were conducted for the 2008 potential update study, so Itron had conducted a study of the savings potential from IOU programs in 2006, there was an effort to refresh that potential study two years after, so 2008, and in the report we refer to it as the "Potential Update Study," that study was what we call a very detailed bottom-up study, we are looking at measure level cost and savings and adoption for, you know, 300 plus unique measures, using the asset models developed by Itron as an Itron product, but this is a big, complex, detailed bottom-up potential assessment. The output, the primary output of that study was looking at the achievable market potential for IOU programs, specifically. So looking at how much savings are realistically achievable

at specific levels of measure incentives and marketing expenditures, for example, how much is realistically achievable through IOU programs, specifically, over a specific time horizon.

Now, the analytical approach that we developed for the goals study, we wanted to leverage that analyses and those results as much as possible, we did not want to reinvent the wheel again, specifically because that study was just wrapping up when we were starting the goals study. And we also wanted to be able to broader the scope a little bit, not stay focused solely on IOU programs because there are all kinds of stuff happening in California and nationwide. The asset model is limited to -- is specifically meant to address achievable market potential from IOU programs, so we wanted to try to build a tool and analysis that examines things from other delivery mechanisms like codes and standards, for example. So we built a spreadsheet modeling tool that used -- that incorporated the inputs and the results of the '08 potential study as starting points for exploring alternate scenarios.

This slide is really just kind of breaking down the main mathematics; it is actually quite simple for anyone who has done any type of end-use decomposition analysis before. The basic analytic identity is total energy consumption is a product of unit energy consumption, so this

is a residential example so you can think of it as a refrigerator, kWh per home per refrigerator times the saturation, the share of homes with refrigerators, times the number of households. Right? Fairly simple analytic identity multiplicative…. And some of these things can change over time; namely, number of households, obviously, but also the UECs, and UECs change as a function of energy efficiency and changes in the energy service demand. So we decompose the UEC variable into basically three components, this is among the bottom half here, this is the base or start year, you know, year zero UEC where we are at now, and then multiply by -- the second term is changes in the technical efficiency, and the third term is changes in energy service demand. Changes in technical efficiency obviously bring the UEC down, changes in service demand can bring the UEC up or down, for example, if you have more fixtures in your home that is going to increase the service demand, smaller refrigerators might decrease service demand. So the UEC can change because of changes in either one of those variables, and we wanted to isolate changes in technical efficiency, savings related to changes in technical efficiency. So that is reflected in this decomposition.

The baseline data that was used in the '08 Goals Study, we used the same key sources that were used in the

two previous potential studies in California, namely the most recent RASS and CEUS Surveys, and also all of the industrial end-use analysis that had been conducted by KEMA for the industrial potential studies, they were subcontracted by Itron on both the '06 and '08 studies, and so we used all their baseline development work, as well. For the forecasts of changes in building stocks over time, we used the new construction rates and decay rates that were reflected in the CEC Demand Forecast, and this is the vintage 2008 forecast, this is the one that was available, I believe, fall of 2007. So that was the vintage of the forecasting that was available to us when we did the Goals Study, the original Goals Study. So that was the baseline data.

We used the same sets of inputs in the Goals Study, the original Goals Study. And I allude to, you know, we developed alternative policy scenarios, and savings from things other than IOU programs. This slide is just summarizing all the scenario analyses that we did. The ones that I will talk about more later that are germane to this incremental uncommitted savings analysis are IOU programs, obviously, and then there were three sets of kind of policy scenarios -- well, actually two sets of policy scenarios, and then two different perspectives on them; so, first is the big, bold energy efficiency strategies, these are very

briefly, for those not familiar, initiatives that were initiated by Commissioner Gruenich, and I think this was spring of 2007, I believe, and they set targets for -- there are three pieces, there is a small HVAC initiative, and that is really trying to get optimally performing AC as a retrofit, and then there are two reconstruction initiatives -- residential and commercial, and they both have targets for zero net energy new buildings. That is kind of the essence of these programmatic initiatives.

We also looked at future codes and standards in three groups, AB 1109, which is referred to as the Huffman Bill that was passed in, I think, 2007, and setting new standards for lighting, general service lighting. In California, their strengthening of Title 24, which is the CEC mandated to investigate every three years, and revisions to federal appliance standards, going forward, also co-compliance programs, trying to increase co-compliance with Title 24. But those kind of -- these other policy delivery mechanisms, we analyze them from two perspectives, primarily the perspective of the IOU, versus the societal perspective, and the reason that is important is that, take the case of the lighting standards from the Huffman Bill, right, lighting takes account for a fairly large share of the IOU portfolios; your new standard is basically going to change the baseline, it is going to obviate some of the measures

that are available to be incented in IOU programs, so they interact. Changes in codes and standards interact with what is available to the IOUs to offer programmatically. And so we wanted to try and get a handle on what the magnitude of those interactions might be. You know, conversely, the societal perspective on codes and standards is, you know, you might change the baseline and you are also going to get a significant savings from something like implementation of the Huffman Bill, and we wanted to get a handle on how big those societal savings might be, as well.

So we ran all these -- we developed these individual scenarios, and then, to get to kind of translate those into a internally consistent set of -- we call them Straw Man cases, but really we are trying to get to internally consistent set of policy choices that lead to an outcome to use for goals setting. And so you can see on the first column, the left-hand column of this table, this is kind of like these are all the different mechanisms that we modeled, and then it is marked "low," "mid," and "high," and so we constructed Straw Man cases with different choices, discrete choices in each of these cells, to construct a total goal level associated with these low, mid, and high cases. And I will not spend too much time on this, but this just kind of summarizes, you know, we will be talking later about low, mid and high goals cases, and this is how those

cases were composed. They were composed of specific choices about these specific mechanisms, so, you know, how far do we get towards implementation of the Huffman Bill? How aggressive is the future for Title 24 and appliance standards? How far do we get with meeting the Big Bold Initiative targets for zero net energy homes? So this is the exact composition of the low, mid, and high cases that I will be circling back to, later on.

So that is kind of -- that is the five-minute or ten-minute version of the Goals Study, and I would be happy to answer more detailed questions about the Goals Study at the end. It is available on the ED website and has been for a while, along with a full set of appendices with all the supporting data.

So for this study, right, we wanted to -- you know, the task was to figure out how much of what was included in the Goals Study is uncommitted and how much of the savings from those uncommitted programs is incremental to the savings already imbedded in the IEPR forecast. So the approach that we had to do this was basically four pieces, we needed to define scope and boundaries, which was really critical, we had to calibrate the end-use baselines, we wanted to make sure that we were not introducing any systematic bias because, you know, our refrigeration UEC was way off from theirs, or our housing forecast was different

from theirs. Then we transformed -- we had to exercise and transform some of the savings estimates produced by CEC's end-use forecasting model into inputs that could be used in the SESAT process, and then, after all that, rerun everything and actually do the calculation of incremental, uncommitted savings based on those revised results. So I am going to step through each of these pieces.

Obviously, the first step was we wanted to define the analytic scope on some of the boundaries that I was referring to. The first step was common base year, this might seem obvious for everyone, but the CEC forecasting model has a base year of 1975 versus using the 2006 base year for the Goals Study, so obviously those are very different reference points, and we wanted to make sure we get to apples and apples as much as possible, so we settled on 2006 for this study. The geographic scope was limited strictly to the service territories of the IOUs, and this is a subtle point, but important because the CEC forecast is at the planning area level, which is distinctly different from IOU service territories. So, for this, since the goals are at the service territory level, we wanted to make sure that our estimates of incremental committed were also at the service territory level for the three IOUs. And finally, the last step is the programmatic scope, and I call it programmatic scope because it is really trying to figure out

substantively what is in the '09 IEPR forecast, and what is in the '08 Goals Study, and how much overlap, and specifically where there is.

So the last step is actually where we focused -- we spent a lot of time -- and this is actually one of the key parts of this study -- we learned a lot. This slide kind of summarizes the findings and analysis, so we worked very closely with the ED staff -- sorry, with CEC staff -- to really dig down into the guts of the CEC's energy forecasting model, and really figure out specifically which programs they were modeling through the committed program period. And this summarizes the finding of that effort. Both IOU programs are included in the '09 IEPR forecast and the '08 Goals Study. There were some, you know, obviously in the Goals Study, we also had Title 24, we had the Huffman Bill, we had big bold, the IEPR forecast included Title 24 savings that we did not count in the Goals Study, and that was from Title 24 -- basically kind of their Title 24 triggered retrofits, so when you do remodels of a certain size in the commercial sector, it trickles Title 24 compliance. In the Goals Study, we only had savings from new construction compliance with Title 24. Those kind of Title 24 triggered retrofits were mainly in commercial buildings and mainly in commercial lighting systems. The CEC also included residential and commercial price effects,

which were their way of modeling naturally occurring savings, so there was also some overlap there. So these are all for the committed program period. When we get out to the uncommitted period, obviously all of the mechanisms that we included in the Goals Study were also there, inactive and producing new first-year savings in the uncommitted program period. In the case of the IEPR forecast, there were three pieces, three delivery mechanisms that were producing new first year savings in the uncommitted period; they had obviously ongoing price effects from changes in the electricity prices. And they also had what is referred to in the IEPR Report as additional residential lighting savings, and those are credited to, at least a partial implementation, of the AB 1109 lighting standards.

So I know I went fast, I just want to make sure -- okay. So using that information that was kind of summarized in the previous slide, there is obviously some overlap in those three mechanisms, you know, residential price effects, commercial price effects, and this additional residential lighting savings category. There is some overlap between those three mechanisms, and some of the savings are from uncommitted programs in the Goals Study, specifically naturally occurring from IOU programs and savings from AB 1109.

So we worked very closely, again, with the CEC

forecasting staff to come up with an agreed upon way to avoid double counting in those three particular mechanisms. And so this slide is really kind of summarizing the programmatic scope, what do we count -- what savings do we count from uncommitted programs as being incremental? And there are three primary adjustments that we came up with, one is for effects, savings from residential programs, residential IOU programs, and we did not want to double count the residential price effects that the CEC had included, and so we decremented the naturally occurring savings for residential programs as forecasted by Itron, previously. And the reason that we just treated it as a decrement and not fully duplicative is that the CEC only actually estimated price effects related to the miscellaneous end use, as opposed to all or more residential end uses. So it was very limited, plus the elasticity was small, to say the least. So we treated it as a decrement to residential naturally occurring.

For commercial programs, the CEC's price effects were much stronger, and we did a comparison with the naturally occurring from commercial programs that came out of the asset model, and they are actually quite similar, so we decided that, in concept, they were 100 percent duplicative between the two efforts, and so rather than treating theirs as a decrement or ours as a decrement, for

the purposes of calculating incremental savings, incremental savings only occur from new net savings from IOU programs from 2013 forward. Okay, everybody is nodding heads. All right. I know that can be confusing, but in principle, we decided that they are 100 percent duplicative, so we did not count any incremental savings from commercial naturally occurring, or commercial price effects.

For the AB 1109 lighting standards, we determined that the way that the CEC estimated that it was really just a partial implementation of those standards, for the Goals Study, we used basically CFLs as a proxy, which turned out to be very close to the way it was actually codified in Title 20 last fall in August of '09. Obviously, by that time, it was too late for them to -- they were too far along in their IEPR modeling process to actually stick to the definition that came out in Title 20, some phasing issues there between the two efforts. But what they ended up doing was kind of a partial implementation of AB 1109, so we treated their estimates as a decrement to our estimates of savings from the new lighting standards.

For industrial programs run by the IOUs, as well as future revisions to Title 24 federal appliance standards, and implementation of the Big Bold Initiatives, all of the new first year savings from those programs in the uncommitted period were treated as strictly incremental, it

was determined that there was no overlap between the two forecasts. Okay? So once we got through that process, obviously we wanted to recalibrate all the end-use baselines and the service demand drivers that were used in the '08 goals forecast, we wanted to make sure that we were harmonized with the values that were used in the '09 IEPR forecast. You know, there were basically two key components of this calibration process, one was the -- we wanted to use the exact same service demand driver, so housing stocks, commercial floor stocks, and industrial base load is just analytically what we used as the driver for industrial, and we can get into that if you want, it is a little -- it is not super straightforward to explain. But, you know, these are high level service demand drivers, so we adopted exactly the same forecasts of these three key service demand drivers in this study. And, you know, they were slightly different. You can see at the bottom box here, it kind of summarizes how different they were. You know, these are largely the, you know, the '09 IEPR forecast reflected some recession effects and so, obviously, that impacts total stock additions in residential/commercial buildings over 20 years because they had a dip in GDP in new construction rates in the early years of their forecasts, so you can see how the bottom line is that, by the time you get out to 2020, the total commercial building stock and the total commercial

industrial load growth were significantly lower than previously.

We also calibrated the end use baseline, so this is the year zero of the forecast. Largely, they were consistent, and when we interacted, all of the revised service demand drivers and all the end use UECs and saturations, we came out pretty close without doing any adjustments, but we did do a few because we lined up all the baseline UECs and saturations and compared them to make sure they were not out of whack. But we did make a limited number of adjustments, and they are kind of itemized here. We revised the residential space heating and refrigerating UECs and saturations, and we adopted the CEC values. We revised the peak to energy ratios for all residential end uses -- and I will get back to that in a minute -- and those two adjustments were done for all three IOUs. For San Diego Gas and Electric, we had two additional revisions, basically we see in saturations and also the peaked energy ratios for commercial interior lighting.

Now, this shows the final kind of calibration values in energy and peak demand terms. One thing you will notice is that we calibrate the '06 actual sales and we end up calibrating to the forecasted '09 summer peak load, coincident system peak load. And the reason we did that, the first time we used '06 and '06 was an unusually hot

summer, and we used all of the peaked energy ratios from '06, and obviously the peak numbers were large. So we decided -- and this is a change from the last, from the workshop we had in December, I think we mentioned it, but we had not implemented it. So for this time, we wanted to make sure that we used peaked energy ratios that were reflective of a normal weather year, and so we chose 2009 as kind of the calibration year for coincident peak demand, and so the bottom half of the box shows where we landed relative to '09 forecasted coincident peak.

And just to ground everyone in the goal of this calibration process is not -- for us, anyway -- is never to dial it into 0.00 percent because to get there would require very -- you are making a square peg for a round hole. What we aim to do is to get within a range that we feel comfortable with, and that is usually plus or minus five percent for a potential study. So this is where we landed, you know, and in all the work we try to avoid introducing systematic bias, and calibration is an important step where sometimes people dial it in all the way artificially and it can introduce systematic bias. So we went through, we defined all these analytic boundaries, we have calibrated the baseline, one of the last steps was to transform the CEC savings estimates across all these different delivery mechanisms, and transform them into inputs that could be

used in the SESAT modeling framework. Specifically, this is in the second bullet, into percent reductions in base year UECs, that is how savings are expressed going into the SESAT framework. So to do that, CEC provided a variety of time series data, average and marginal UECs and this is all at the end use building type and vintage, and IOU service territory level. They did a special run of their model without price effects, basically turning the price effects off so that we could isolate the magnitude of those effects, and then for -- they also provided special estimate -- time series estimates of their savings specifically from AB 1109 and these Title 24 triggered retrofits in commercial buildings. And then we transformed all these things into these percent reductions in base year UEC values, you know, the primary purpose was so that we could use them in SESAT in the right metric, in the right unit, but it also is a way, another way, to help avoid or minimize systematic bias. So, you know, when you add Gigawatt hours to Gigawatt hours from two different modeling platforms, you can get a perverse result like exceeding technical potential, for example, or in the other extreme, resulting in load growth from a savings measure, I mean, it happens and that is related because you have different base year UECs or, you know, some other type of disconnect that, if you just try to add absolute savings to absolute savings from two different

platforms, you can get some perverse results. So doing this unit transformation and normalization process was also designed to try to minimize that type of bias. But, you know, despite all we can do, the nature of this type of study is that we cannot eliminate all systematic bias, and that is just the truth of the matter. We are trying to meld inputs and results from two different modeling platforms. So we do all this work, we have calibrated the baseline, we have figured out what is in, what is out, we have transformed all the necessary numbers into quantities that the SESAT model can use, and then we re-run everything and then we calculate incremental uncommitted. It seems very simple. I will get back to that in a minute.

I wanted to touch first on just the scenarios themselves. Like I said previously, the goal study scenarios and the documentation associated with those have been available since the goals decision came out, so this is almost two years, maybe the better of a year and a half. I am not going to delve into the details of each one of the scenarios and the assumptions that went in there, and in large part, all of the scenario definitions and assumptions were identical to those that were used in this study. Mike Jaske alluded to the fact that we did make some revisions to try to incorporate, you know, knowledge learned since the time that the goals study was conducted, which was the fall

of '07, spring of '08. Specifically, there were two things, two assumptions that were revised to kind of better reflect reality as we know it today, and they were specific to the 2008 revision to Title 24, which ended up not happening, more or less, and the assumptions that were used to describe the standards associated with the implementation of AB 1109. So I had said previously that we use CFLs as a proxy when we did the '08 Goals Study, but since that time they have actually been codified into Title 20 as of August of last year, and so then we adopted those more specific -- well, the specs that are in Title 20 now. And so we made those adjustments. The detailed descriptions of all the scenarios are replicated and provided in Section 3 of our Technical Report that you guys all have now, and I would be happy to answer any questions or provide clarifications associated with those more detailed assumptions and definitions in Q&A, but for purposes here, I want to get to the end, and I am going to skip that, but I will tell you specifically more about what was changed versus the '08 Goals Study. In the '08 Goals Study, we had regular three-year updates to Title 24 at various levels of aggressiveness. I think it ranged from down to five percent decrease in UECs every three years to 15 percent or something like that, but it was regular every three years.

In the 2008 Title 24 proceeding, two things of

relevance happened, the standards themselves were essentially unchanged, and the implementation date was shifted out to 2010, so they were effectively -- there was no significant real revision to the current 2005 Title 24. So we wanted to reflect that, obviously, in this exercise and so we took out the assumed '08 revision to Title 24. Easy enough. For internal consistency, we also -- the savings from the Big Bold Initiatives interact with the true societal net savings from the Big Bold Initiatives, and since it is also a new construction measure, they interact with the Title 24 baseline that is in place at the time, and so we also revised the assumed interactions with the Big Bold Initiatives over that intermediate timeframe -- '08 through 2011.

So like I said previously, in the '08 Goals Study, we had the Huffman Bill implementation, we used CFLs as a proxy, number one, and we also assumed kind of a linear progress towards the Huffman targets as defined in the original legislation, linear progress between 2011 and 2020. And that phase-in was just an educated guess on our part. It turns out the way it is actually codified in Title 20 is that it does phase in in 2011, but there is an interim standard of -- I do not know if I have it on the next slide -- no, I do not -- the interim standard in 2011 is 20 lumens per watt, more or less, it depends on the output range of

the lamp. But 20 lumens per lamp is -- it is less than a CFL, let's put it that way, it is more than current incandescents, but it is significantly less than a CFL, and then it ramps up to 45 lumens per watt in 2018, which is slightly exceeding kind of the market average CFL right now, but it is pretty close. But the periodicity associated with that, the way it is specified in Title 20, we tried to replicate that as closely as possible for this study, which is not quite linear. It has a little S-shape to it, the way we implemented it, so that is different. And we also had to -- since these new standards interact significantly with IOU programs supporting CFLs, we revised the interactions with the IOU programs, as well. So that is a summary of what changed and, again, the details of what did not change are obviously documented in the report.

So we have all this, we have revised baselines, we have new inputs, we have some revised assumptions, what do we do with all that? We basically re-ran savings forecasts for each of these scenarios, and what that produces is, at first, is just a comparable set of savings forecast for the low, mid, and high goals cases, and the savings mechanisms embedded in the '09 IEPR forecast. So at least we have gotten to the point where we can then start adding and subtracting and doing other manipulations, or as good of apples to apples type of thing that we can get to. Now, you

know, we modeled things at the mechanism level, so Huffman Bill, Title 24, IOU programs, etc. We recomposed the low, mid, and high goals cases according to the same criteria that I showed before, this table is the same as what I showed before, but to serve up as a reminder, right, we have revised estimates for each of these delivery mechanisms from the two different forecasts, and then we kind of recompose the low, mid and high goals cases.

Now, I am going to show you that straight result, kind of low goals case versus the IEPR forecast, etc., in a second. There are a few kind of -- in terms of interpreting the results, two things to take note, and we talked about this explicitly in the report. For simplification, we combined just for data display -- we combined the residential and commercial price effects with the additional res lighting savings, so that is -- and it is labeled as such, but I just wanted to be clear, otherwise you get too many small wedges dancing around and it is hard to read. We also combine the savings from the Title 24 triggered retrofits in existing commercial buildings with savings from IOU programs, you know, as modeled by the CEC, so I am talking about the mechanisms that were modeled by the CEC; we combined those two results for presentation here, so just in case people are wondering, those Title 24 savings that they model are still in there, they are just shown together

with the IOU program savings. Probably, the utility folks are going to notice that the low, mid, and high outcomes do not exactly match what is in the current adopted goals, the two main reasons for that, and for me it makes sense, but it might not be obvious to everyone, the two main reasons that we are using slightly different forecasted demand drivers, and we saw exactly how much those are different previously, we also use different peaked energy factors for the residential sector than previously, and so that is only going to impact the peak megawatt numbers, not the gigawatt hours numbers. And we also had slightly different assumptions related to the '08 Title 24 and the implementation of the Huffman Bill standards. Those are different from the '08 Goals Study, so obviously the results are going to look slightly different because of that.

And just for clarification, the savings, the results that I am going to show here and that are shown in the report are over the forecast periods, specifically. We are showing cumulative savings over the forecast period. That is different from how the CEC staff shows energy efficiency savings in the IEPR Reports, they show them cumulative starting in 1975. And they also show savings from, for example, 2005 Title 24 out through 2020. Our Goals Study did not -- we did not model future savings from existing standards in the '08 Goals Study, that is just a

point of clarification, we had -- if the standard was anticipated to revise, then we estimated future savings from that, going forward. But, for example, we did not have savings from the 1990 refrigerator standard in these set of results. All that type of thing is already included and modeled by CEC forecasting staff. Does that clarification make sense? Or am I confusing people? Okay. It seems obvious to some, but it causes confusion with others, so I wanted to make sure that was clear.

So, like I said, this is the results for the low case compared to the savings in the CEC -- in the '09 IEPR forecast. And I had struggled with Excel to get this to show correctly, but through the committed program period, the savings embedded in the '09 IEPR forecasts are actually slightly larger than the low goals case, so that is why the dotted line show how the low goals kind of savings wedges are actually behind the blue and light yellow wedges. Does that make sense to everyone? It is really difficult to get Excel to do this, so this is the best I could do. But the bottom -- the story line is that, through the end of the committed period, the CEC savings are actually slightly -- the savings from committed programs estimated by the CEC are slightly above the low goals case through 2011. And then the low goals case kind of peaks up at the end. The primary reason behind this is the CEC -- and, again, you could see

from the size of the blue wedge, which is the IOU programs versus that light yellow wedge, which is price effects, you know, it is almost all IOU program savings. And the same is true in the low goals case, you cannot really see it. This dotted red line, that is the IOU portion of the low goals case in the committed period, and it accounts for the vast majority, 90 plus percent. But the primary reason why they are slightly different is that the low goals case assumed what is referred to in the '08 potential study as "base restricted market potential," and at the time this was reflecting kind of weighted average incentive levels circa 2005-2006. And it turns out that the weighted average incentive levels and actual portfolio since then has been higher than that. The CEC's estimates, assumptions relative to incentive levels were actually based on program filings, which, as I just said, were higher on weighted average terms than what we are assuming the base restricted market potential case in the asset study. So that was a mouthful, but basically the incentive levels assumed in the goals case, in the low goals case, were lower than what were actually done, and the actual levels are what, from program files, is what the CEC used in the '09 IEPR forecast, so that is the primary reason why they are different. There are a couple of reasons that I will touch on later, but that is the main one.

Now, going forward from 2012 into the uncommitted period, one of the things that you will see, I actually hid it, I do not know why I did that, you can see that the cumulative savings from IOU programs and the CEC's forecast start to decay pretty significantly over time, and that is because the assumption that there are no efforts to, you know, continuing IOU programs basically, there are no kind of -- program efforts stop in 2012, and then when things reached the end of their useful life, you lose the savings, so that is the concept behind that savings decay. The low goals case obviously continues to grow because all these mechanisms, IOU programs, Title 24, they are continuing to be in place and actually grow over time. The biggest piece of the low goals case in 2020 is IOU programs follow by the Huffman Bill, which is that orange wedge. And some, you know, small but still significant contributions from provisions in Title 24 and federal appliance standards, and progress towards these Big Bold Initiative targets for zero net energy homes and buildings.

Now, so this is the energy case and we switch to peak demand. The story over the committed period is largely the same as before, the real difference is in the uncommitted period, mostly in terms of the composition of total cumulative savings in the low goals case because where this is the coincident peak demand case, things that have

savings that are more coincident with a system peak obviously show up larger, and this manifests itself if you look at the difference between savings in the Huffman Bill and savings from zero net energy homes. The savings in zero net energy homes are larger linked to AC, whereas Huffman Bill is strictly lighting. Lighting has a very different load shape than AC, so it has very different peak demand impacts, and you can see how that manifests itself in aggregate here, so the composition of savings from peak demand perspective is significantly different from the energy kWh hour perspective. And you will see this again when we walk through the other cases.

This is the mid goals case for energy. Now, this one, I did not have any problems with Excel, but the CEC forecast obviously stays the same, the mid goals case has what we call a full incremental cost assumption for IOU programs, so you are assuming higher incentive levels offered through IOU programs, and that actually obviously buys you a lot more savings, so that is the primary difference between the low and the mid case. Because of the increases option of stuff through IOU programs, particularly lighting, the incremental savings from the implementation of the Huffman Bill are relatively smaller, right? If people buy up more CFL's, by the time Huffman is implemented, the incremental savings from Huffman gets smaller, that is one

of these interactions that I was talking about, and you can see the magnitude of that interaction here, I can flip back two slides to see how big the orange wedge is this time around. And then it gets smaller because we are still forecasting the same total outcome for the standard. But the incremental impact of that standard is relatively smaller because the IOU's have made a lot more progress in terms of market transformation for lighting by the time that standard takes effect.

This is for the mid goals case, the peak demand savings version, same kind of story as before. You can see the savings from the peak demand savings from the Big Bold Initiatives play a much more prominent role, especially relative to the Huffman Bill and IOU programs. I think I will just leave it at that for now.

And finally the high goals case, and the primary difference between the mid goals case and the high goals case is there is no difference in the level of IOU program funding, and so that red wedge is more or less the same. You do see bigger impacts from the Huffman Bill, Title 24, Appliance Standards, and relatively less from the Big Bold Initiatives and that is because there are more aggressive assumptions about Title 24 and more aggressive assumptions about, you know, having success implementing the Huffman Bill. So the reason that the big bold -- the impacts from

the big bold go down, is because Title 24 is getting more and more aggressive over time, so, again, the incremental impacts from the zero net energy home relative to the standard are lower than in the mid case.

And finally, the peak demand savings forecast in the high goals case, again, largely the same story as before; savings from the Big Bold Initiatives for zero net energy homes is taking up a much larger share compared to the energy case.

So now that we have all these revised set of results, revised and hopefully comparable results, these form the basis for calculating what we are actually interested in, and that is what portion of savings from uncommitted programs are incremental to the savings already in the IEPR forecast. And this is specifically from 2013 forward. And the second bullet just kind of reiterates what we went through before and that is the key step to doing this calculation is knowing or determining which programs, which delivery mechanisms are incremental to the ones imbedded in the '09 IEPR forecast and which ones are duplicative or overlap.

So this is also a repeat of before, but I just want to make it clear, the table summarizes the way that the "adjustments," what specific delivery mechanisms in the goals cases were considered as uncommitted programs, and any

adjustments that we made from savings from those programs -- this is from 2013 forward -- any adjustments that we made to avoid duplication or double-counting from stuff that was in the '09 IEPR forecast. So, again, these are cumulative savings from these programs as modeled in the '08 Goals Study from 2013 forward with those adjustments. And so, having said that, there are a couple things to understand about that methodology, that calculational methodology of trying to make those decrements and using 2013 forward, etc. The method that we used to calculate incremental uncommitted does not account for any differences between the CEC savings estimates and the goals case savings in 2012, right, so as I showed you before, they do not line up perfectly in 2012, but we do not do anything mathematically or analytically about carrying that gap forward, or incorporating any part of that gap forward. Does that make sense? So the differences that exist between the two savings estimates and the two models in 2012 does not factor into the calculation of incremental uncommitted the way that we have done it to date. Okay? The second point is that we saw in all the previous charts that the IOU program savings in the IEPR forecast do decay pretty significantly over time. The accounting methodology that we came up with in collaboration with CEC and ED staff was to essentially treat cumulative savings from IOU programs through 2012 as constant, going

forward, so we did not actually incorporate any of the projected savings decay as modeled in the IEPR forecast. We did not incorporate any portion of that savings decay in our calculation of incremental uncommitted, so we effectively treat it as constant. And the reason we did that is to conform to the current PUC policy rules with respect to the IOUs being responsible to replace decayed savings from previous program cycles. So, by treating cumulative savings from IOU programs through 2012 as constant, going forward, so we are only counting new first year savings from IOU programs, 2013 forward, we are not incorporating any -- it does not reflect in the incremental uncommitted calculations any replacement of decayed savings, those are assumed to be associated with committed programs

-- replacement of decayed savings. I am looking specifically at Phil. This is a sticky model, I want to make sure that, conceptually, everybody understands.

So I am supposed to repeat the question for the folks on the phone, but I am not sure that I got it. So the question was, how does this assumption about the way that we treated or did not choose to address savings decay in the incremental uncommitted savings analysis -- how did that impact the result? And I am going to get to that explicitly in the uncertainty section. Phil's question, I thought it was, how was savings decay treated in the asset potential

study, but that was not it? So Phil's question was, the September rule from the PUC was that the IOUs are responsible for replacing 50 percent of decayed savings; now, the formative stage of this methodology was prior to that point, so the rule in place at that point in time was 100 percent, or was implied to be 100 percent. So right now, this bullet that I am talking about here, the policy rule that I am referring to here, is that the IOUs would be responsible for replacing all of the decayed savings, so that is the assumption that is embedded by -- assuming that those cumulative savings through 2012 are constant over time, going forward from there, it is basically saying that replacing all of the savings decay from those previous program cycles is associated with committed programs and not uncommitted programs. Does that -- at least for now, does that make sense? Okay. I need to keep on track, so….

Sy's question was how does the PUC's policy deal with changes in decay rates due to changes in prices. And I cannot -- I am not ED staff, so I cannot tell you. I cannot answer that, I do not work for PUC.

So let's -- I just want to make sure that these points were clear so that we interpret the results that I am going to show correctly, that is all, and we are going to talk about the sensitivity of that particular assumption later. So, just to be sure that everybody understands, the

results that we are going to show do not interact at all with the savings decay assumptions that are imbedded in the IEPR forecast, okay? Mr. Jaske?

DR. JASKE: So just to try to set the stage, this issue is written up in detail in the staff report, and what Mike is describing is a convention we adopted for the terminology to use to describe this phenomenon. So decay and its replacement is a function of committed program savings, whereas, his analysis is an analysis of the incremental savings of uncommitted programs. So the staff report writes up as an issue what to do about this issue of savings replacement from committed program decay. And so keep in mind that there is now in effect two questions asked of the PUC, you know, when this whole package goes, which one of the scenarios, or how to treat the three different scenarios, and what to do about committed program savings decay. So that is an evolution of the nature of the question going back to the PUC for the PUC to decide what to do compared to, you know, where we were a year ago, in thinking about what this analysis was all about. And the PUC has issued some decisions, as Carmen's appendix notes, that deals with facets of this, not completely clear to me that the PUC has ever really confronted this issue on a longer term, going forward, you know, sort of planning basis. So that is where I think things are from the staff's

perspective. And so let's try to let Mike move forward with his analysis of the incremental programs.

MR. TING: And, you know, the way I want to frame it is just to make sure that everybody in the room and on the phone interprets these results for what they are and what they are not, right? So I want them to understand the basics of the methodology to make sure you interpret the results correctly. So, these are kind of the bottom line results and aggregated across the residential, commercial, industrial, low, mid, and high. We show them by kind of the primary categories, these four main categories of uncommitted programs. And these are the Gigawatt hour results across all three IOU service territories aggregated together, so it is probably less meaningful for the IOU folks in the room, but for purposes of presentation, we are just showing the aggregate results across the three utilities. We are looking at the last column, 2020 savings; we are looking at incremental uncommitted energy savings ranging from around 10,600 Gigawatt hours, all the way up to 14,300, roughly. Those are not very meaningful for people generally -- who knows what a Gigawatt hour is? That is roughly -- I am not sure if I wrote this down -- someone is going to have to correct me if I get this wrong, but I think that is between 10,000 to 14,000 Gigawatt hours of savings from 2013 through 2020, is the benchmark, that is 50-70

percent of the growth in sales forecasted in the same period in the '09 IEPR forecast, right? So it is roughly half to three-quarters of the growth in sales over the same period in the '09 IEPR forecast. That is probably the most meaningful benchmark for these large numbers. You can look at the relative contributions across these uncommitted programs, just take the mid case; for example, you could see the more than half, the lion's share from IOU programmatic activities from 2013 to 2020. You can see that the relative impact of the Huffman Bill varies slightly, and that is because of interactions with IOU programs, mainly. So it varies from 3,600 Gigawatt hours in 2020 in the low case to 1,600 in the mid case, to 1,800 -- well, sorry, 2,400 in the high case, and that is reflecting both in the low case the assumption is that we do not quite get to full compliance with the Huffman -- you know, we do not quite hit the original Huffman targets by 2020, whereas, in the high case, we hit them. But it is also interacting with the level of IOU programmatic efforts through the beginning of the phase-in period. So you get bigger impacts in the low case because, you know, the IOUs are achieving less lighting savings by the time you get to the implementation phase; whereas, in the mid case, you get relatively more savings captured through IOU programs by the time the standards take effect, so then the incremental impacts from Huffman go

down. But from an energy point of view, obviously, IOU programs are taking up the lion's share of incremental uncommitted. And then, you know, it is fairly well distributed between the new lighting standards revisions to Title 24, the new federal standards that are on the rulemaking calendar, and progress towards the next year energy targets for new homes and buildings.

So Rick's question was, was the results that just showed just the tabular version of the earlier charts, and the answer is no. So this chart is -- we rerun the models, right, we recalibrated the baseline, we revise the inputs, we have done all that other legwork. And we re-run the models, and this is what you get, and this is just so we get comparable results between the two forecasts. Then we implement these changes summarized in that box, right? Number one, incremental uncommitted is only from the first year savings from 2013, forward, for these particular mechanisms with these particular adjustments. In this case, it is two decrements and then, you know, we are only counting new net savings from IOU commercial programs, okay? Does that make sense? And so these numbers reflect the end result after those adjustments, and only counting 2013, forward.

Yeah. All the tabular data for the graphs are in there, as well as more detailed versions of these final

results for incremental uncommitted by sector, and delivery mechanism, and case. I know that was confusing for people in the earlier drafts, and I admit it probably was not very clear. But hopefully it is clear now. So this is the energy results. These are the bottom line results in terms of peak demand, and as you can probably anticipate from the earlier charts, they are different than terms of composition. And they are also slightly different in terms of slope. It is a little bit more aggressive in terms of, you know, savings rates per year. And that has largely to do with the relative contribution of the Big Bold Initiatives for zero net energy homes and buildings because they take up -- they ramp up -- the interim milestones for those programs kind of kick-up in the latter half of the forecast period, and the peak savings associated with those programs are relatively more than IOU programs, or the Huffman Bill, that have relatively flatter load profiles associated with those savings. You know, and the ultimate illustration of this is that. So, bottom line number, 2020 load case is 4,000 megawatts, mid case is 5,300, high case is 6,400. Those benchmarked to the incremental load growth, coincident peak load growth in the '09 IEPR forecast from 2013 through 2020 is, I believe, 75 percent in the low case, close to 100 percent in the mid case, and 125 percent in the high case, so that means, in the mid case, the incremental

uncommitted savings for peak demand represent zero load growth. That is kind of the first blush interpretation of it, so zero load growth from 2013 to 2020. And in the high goals case, you would actually, first blush, a total reduction. Don?

So Don Schultz is offering a different way to normalize this and, you know, I am not a load forecaster, so I clearly do not have all the right benchmarks in mind, but I am just trying to ground some of these big numbers, and numbers that actually mean something for planning purposes. So Don is offering a different normalization that the 2017 results more or less represent the equivalent of two gas-fired base load plants. Is that what you are saying? It is one way to interpret the outcome, yeah. So I do not want to claim that this means zero load growth, or negative load growth, or zero procurement authorization, or anything like that because that is probably not what it means. But I am not a load forecaster or a procurement guy.

So Tim's question is, if we had taken into account the decay rates in this EC forecast, in the methodology for estimating incremental uncommitted, how would that directionally impact the numbers on this chart? And the answer is they would go up, so more incremental uncommitted savings. So that is the case where replacing decayed savings would be associated with uncommitted programs,

rather than committed programs. Okay, so you know, I only had two -- that is all I have to look at the bottom line results, and, well, sorry, before I leave that, the other -- as I said before, the big difference between the energy results and the peak demand results is the relative contribution of the Big Bold Initiatives for zero net energy homes can take either the mid or the high case and, you know, look at the exact contribution to the total. You know, we are talking 40-45 percent of the total, that is a very big chunk, and I am going to talk about this later, but I just wanted to point that out specifically. Obviously, IOU programs are still one of the primary contributors, but in the peak demand case, the savings from the incremental, uncommitted savings from the Big Bold Initiatives, as reflected in the goals study and the current adopted goals, you know, becomes a pretty major player. And I am going to talk about that more in a bit.

So with all that in mind, I want to spend the next 10 slides or so -- and I am miraculously slightly ahead of schedule, I think -- should we just power through to the end? For my own thirstiness, I am going to get through these next 10 slides and then we can take a break and have a Q&A after that. Is that okay? Okay.

So I want to spend the rest of the time right now just talking about the key caveats and uncertainty issues.

So any exercise of this type, where at the end of the day we are trying to, 1) predict outcomes from future actions, which is inherently uncertain, as any forecaster will tell you, and then, on top of that, we are trying to interact and meld inputs and outputs from two different modeling platforms in a way that avoids significant systematic bias, all right? And has some semblance of internal consistency, this double-edged sword going on here. For us, you know, in the face of this, the primary task was to reconcile -- well, sorry -- in the big picture, there was no way that we were going to be able to reconcile all the differences between the two modeling platforms, period -- certainly not in the time allotted for the study. What we did try to do was focus our efforts on reconciling what we felt were the most important differences in inputs and methodologies and assumptions, specifically -- and I am summarizing these four bullet points -- reconcile the biggest differences in the way the baseline end use -- energy consumption and peak demand -- are characterized, specifically UEC's, saturations -- and this is at the end use and market segment level by service territory -- and making sure that we are using the same forecast of energy service demand drivers, which sounds dumb, but unfortunately it is something that is -- it is kind of fluffed over scarily often. We also want to make sure we did our savings accounting freeze in the same base

year, savings expressed in common metrics, and make sure that we did as much due diligence as possible to identify and reconcile any areas of duplication in terms of programs and delivery mechanisms that were included in both models, and come up with ways to address double counting and avoid double counting from any overlap that does exist. So this is where we focused our efforts. Obviously, there are some differences that do remain. The overall level of uncertainty is, you know, not easily quantifiable, if at all, at the current state of knowledge and tools and data. Based on our professional judgment as the analyst who conducted this study, we feel that there are basically five key areas of uncertainty, and we have a dedicated section of the report that talks about these in depth, and I will just try to summarize each of these for you guys now. So those key differences are -- and this was stuff that was not reconcilable for purposes of this analysis -- electricity price assumptions, differences in the committed savings estimates, annual savings trends over time, as opposed to the total cumulative savings at the end of the forecast period, obviously the issue of savings decay, as we alluded to earlier several times, and uncertainty associated with achieving the Big Bold targets for zero net energy homes.

So with regards to electricity price assumptions, in the '09 IEPR forecast, it assumes a 50 percent increase

in real prices -- Chris has got to help me out -- from 2013 forward? From 2010 to 2020. Oh, I got that wrong, sorry. It is 2010 to 2020. In the Itron potential Update Study, the '08 Itron Potential Update Study, the electricity prices were assumed to be flat in real terms, so they grew with inflation, so obviously the IEPR forecast prices are increasing in real terms over time, whereas the prices were flat in real terms in the Itron Update study. Go ahead, Jaske.

DR. JASKE: Flat circa what year?

MR. TING: This would be -- oh, that is a question for Jean Shelton. I would guess 2006, I am not sure. 2006? I think 2006, that was the base year, so…. Sy?

I am talking about uncertainties associated with trying to do this analysis; in particular, trying to figure out what is incremental between two different forecasts on two different modeling platforms. And these are, by our assessment, the five most significant ones related to how these outcomes are going to be used in the procurement proceeding. Yes, and the fact is that we -- in terms of commercial price response, Sy, that did not factor into the bottom line incremental uncommitted values because we assumed that they were 100 percent duplicative between the two. So ergo, any uncertainties associated with either value are not germane to the findings of the study.

Okay, but we still have got two different price forecasts for electricity across these two studies. In principal, that affects naturally occurring adoptions and any other price-related customer behavior. Now, you know, analytically, it is very easy to envision, okay, we just use the same price forecasts and rerun asset; unfortunately, doing that type of asset analysis like that is actually not that easy, it requires -- that model takes a whole rack of servers, it takes a lot of time and money to do that in the real world, and so it was kind of out of scope for the purposes of this study. But, it is feasible from an analytic point of view; there are time and resource consequences of that that were beyond the scope of the current contract. So I am trying to tell you what the uncertainties are, how it impacts the analysis, and give you an assessment, or at least an idea of what options are on the table, going forward, for the next time around.

I talked about before in some of the area charts about differences, you know, we look at the 2012 values between the delivery mechanisms in the '09 IEPR forecast and what was in the Goals Study, and how they did not line up, the low Goals case was below the CEC levels, the high Goals case -- the high and mid -- were above. As I said before, that is primarily related to differences in the incentive level assumptions that were imbedded in the low, mid, and

high versus the Goals cases versus in the '09 IEPR forecast. So in the low Goals case where the weighted average incentive level was below, it was actually filed and approved through 2009, and then we are in the current filings through 2012, versus what was assumed in the low Goals case, which was that base restricted market potential case, and that is weighted average incentives circa 2004-2005. Whereas in the mid, high Goals cases, the incentive levels are soon to be equivalent to full incremental costs, which is obviously beyond what the utilities actually offered recently and have filed for the next cycle.

There are also differences in realization rates and net to gross assumptions, and I will not go into the details, this is talked about more in the report. Reconciling the differences related to realization rates and net to gross is something that could be done without having to rerun asset, for example, or something that is that resource intensive. Ideally, we would want to leverage all of the ex post evaluation studies that are currently being finalized. None of those studies were available at the time of either the '08 Goals study, or when the CEC staff was doing the '09 IEPR forecast. So if that type of reconciliation was to occur, you know, it is highly advisable to leverage the full set of approved '06-'08 ex post evaluation findings to make sure that, you know,

everything is used in the same sources.

Nonetheless, it is important to reemphasize for everyone here that any differences in the savings from committed programs in the two models, none of those differences through 2012 were incorporated into our estimates of incremental and committed savings, going forward from 2013. So this is reflecting kind of differences in the way that committed programs are modeled between the two modeling platforms, right? But specific to IU programs. But those differences are not incorporated or accounted for in the current estimates of incremental uncommitted savings. Right, because we are only looking from 2013, forward. Does that make sense? I just want to make sure -- there are ways to address these differences so that we get to -- when we look at committed savings programs, we actually get into more of a similar outcome, but despite those differences, they are not impacting the calculation of incremental uncommitted the way that we have done it for this study. Simon.

So, Simon asked do we have all the data to actually do the comparison based on the analysis done to date of, you know, committed savings from CEC's delivery mechanisms including CEC forecasts and stuff, including the Goals cases, and the answer is yes. And we show that in the area charts, that is why we have that vertical line of 2012,

so you can -- you know, you can get a feel for the magnitude of that across the low, mid, and high cases. And these are the main reasons why they are different, and in the case of harmonizing the rebate levels, we would have to rerun assets with the same set of incentive level assumptions. But, again, rerunning asset is a fairly resource intensive exercise, it was beyond the scope of the contract that we had. Harmonizing things like realization rates and net to gross is a little bit easier to do, in principal. In the ideal case, both studies would leverage the results of the '06-'08 ex post evaluations that are not yet approved and available to the public in whole. So there is some uncertainty in annual savings trends and this is -- we kind of elevated this to topic in the report basically because of the context of how it might be used in the LTTP where some of the results for interim years prior to 2020 could be relatively more important, and so we wanted to specifically acknowledge that the SESAT framework is designed primarily to focus on producing robust outcomes for the endpoints of the forecast year, so in this case, 2020. And we leveraged the results of stock turnover modeling outside of the SESAT framework itself, to get at the year-to-year trends. So the specific stock turnover modeling efforts that I am referring to are the stock modeling in asset, which is very detailed, and the new construction rates and decay rates that are

developed by the CEC, reflected in the IEPR Demand Forecasts, so we are replicating those verbatim. And so things related to, so for example, Title 24, the stock turnover modeling is fairly straightforward, right? You are just looking at new construction additions and the cumulative way it impacts that over time. Where the highest uncertainty is, the temporal dynamics of savings from the Huffman Bill, the AB 1109 lighting standards, the way that it was modeling in the '08 Goals Study, as I mentioned previously, we had a linear progress starting in 2011, towards the targets that were in the legislation. For this study, we tried to mimic the specifications that are now in Title 20. There is uncertainty with respect to the way the Title 20 -- for us -- the way the Title 20 was specified was by specific product segments, so they divvied up the market into output bins -- high output lamps, medium output lamps, so there are like five of them. There is not enough market data to be able to segment the lighting market by output bin in terms of sales or how those are applied to fixtures. So we were not able to actually directly simulate the stock turnover, and therefore the cumulative savings over time associated with the way that the Huffman Bill standards are codified in Title 20. On top of that, the volume and diversity of vendors and suppliers in this market is large, probably larger than any other product that is regulated

under Title 20, and you know, potential leakage is a significant issue for this particular standard over time, and obviously could have significant impacts on actual realized savings, particularly through the first year or two years, or three years of the final 45 lumens per watt standard that takes effect in 2018. So there is uncertainty with the way that we have kind of mimicked the interim -- the phase-in and the impact of the interim standards, as well as uncertainty with the endpoint relative to the issue of leakage associated with the final standard and the 2018 standard that has been codified now.

Okay, savings decay, everyone's favorite topic. This is just really a summary of everything we talked about this afternoon, the way it is done in the IEPR forecast is that savings from IU programs to K from 2013, forward. This simulates the theoretical absence of IU programs over the uncommitted program period. And so, you know, measures have reached the end of their useful lives, and then people do not replace them. For purposes of calculating incremental uncommitted, we effectively treated them as constant, going forward from 2013. So -- and this is again to conform to current PUC policy rules. So the question came up, you know, what does that mean towards the bottom line if you had -- so this chart is an example of using an idea of what the size of decayed savings replacement is and how that might

impact incremental uncommitted savings if we were to include those, replace the decayed savings as associated with uncommitted programs. So the size of the purple wedge here at the bottom actually shows the magnitude of savings decay, going forward from 2012. And you can look at the relative size of that purple wedge in 2020 compared to the size, for example, of the red wedge, which is IOU programs and they are roughly the same, so it is a significant sensitivity. This is clear. Sure, Rick.

So this slide illustrates the relative magnitude of that assumption and the sensitivity is large. So it should also -- but the size of this purple wedge also reflects the specific measure of decay assumptions that are embedded in the IEPR forecast. And so you have to consider them for what they are.

So obviously on that chart, you know, given the measured decay assumptions and methodologies in the IEPR forecast, that is the size, the relative magnitude of the sensitivity that we are talking about, but it has to be understood for what it is, it is based on a certain set of assumptions and methodologies. The same is true in the asset forecast. The asset forecast includes measured decay, as well. The approach to actually quantifying measured decay was significantly different from how it is done in the '09 IEPR forecast. In both cases, they are -- we are using

the data that is available to us, but the truth is, there is not comprehensive data or studies to prove either estimate definitively. And if and when this becomes this issue is -- you know, where the rubber hits the road, either in terms of the IEPR proceeding, or the long-term procurement proceeding, or the efficiency proceeding, or wherever, if you are going to argue over whether it should be in, or out, or how it should be treated, it is 50 percent, 75 percent, whatever, there is uncertainty, I would argue, large uncertainty over the magnitude of that, overall. They have their approach, we had our approach. Honestly, we do not know where the truth is because there are not enough studies and not enough observed data across the entire spectrum of measures that are being offered by IOU programs to definitively support either methodology that is currently out there. So there is a need to have comprehensive quantitative assessments to measure decay, to find out what it really is in aggregate, across a large range of measures. That needs to happen. And so, you know, specifically we are talking about regular timely market saturation studies, not one-time studies, but ongoing tracking studies, panel studies of participants, right? Time series analyses of ex post evaluation findings. This is what -- these are specific examples of the types of things that are needed to support robust estimates of measure savings to K in

aggregate, associated with IOU programs. So everybody needs to not necessarily hang their hat on the size of that purple wedge, right? Okay, I will just talk for myself. Because we know that nobody knows, really -- nobody can argue that they know where the truth is and have it grounded in anything that is a comprehensive set of observations in the real world, right? It is all anecdotal. That is my characterization.

So, I do not want you to assume that the height of any of those wedges is incremental uncommitted in year 20 because the starting point for those calculations is new savings in 2013, forward, and all the decrements that we specified before, so it is not as easy as that, and it is easy to get hung up on the height of any of these wedges in 2020, but that is not incremental uncommitted, it is 2013 forward and you have to take into account the overlap in the decrements that we identified previously.

I recalled a high estimate of savings decay, but that is just off the cuff, given what I know, which is probably a fairly shallow understanding of, you know -- I saw the high level assumptions in methodologies, but I do not claim to have a comprehensive knowledge of the CEC methods, but I would call it --

My point is that, you know, the methodology for calculating incremental uncommitted, based on these revised

model results that we did, you could see that the assumption related to savings decay is sensitive, right, the total result that we showed you is sensitive to that assumption. That is the number one point. Number two is that, if you are going to incorporate any level of savings decay into an estimate of incremental uncommitted, we would have to have a comprehensive way, a defensible way, to do it. And right now, there is not a comprehensive data set to support a robust number estimate for savings decay. Period.

DR. JASKE: Let's let Mike finish his presentation, we will take a little break, and then we will have Q&A. But before we do that, I will repeat what I said an hour ago. The staff report explicitly says the PUC has to decide two things, what to do about the incremental savings, and what to do about savings decay from committed programs. So it is framed as best and boldly as we could think to write it out in the staff report, so there is no danger of this issue, you know, falling through the cracks at this point, given what we wrote down, the transcript of this event, but those are two separable decisions that the PUC, in some future process, has got to deal with. So Mike, let's move on to the next subject.

MR. TING: So you know, my takeaway from here, and I hope you take it away, is the size of that wedge, honestly, is an island certain in and of itself. So before

you get too hung up about the size of that thing, know that the size of it is uncertain. If you are going to deal with it going forward, we have to reduce that uncertainty significantly.

So, the last and final major uncertainty is, you know, relative -- the savings contributions from achieving these targets for zero net energy homes, the targets that are associated with these big bold strategic initiatives, so all of the programmatic activities and delivery mechanisms that were analyzed in the Goals Study, with the exception of the Big Bold Initiatives, all of them have very well established funding sources, program administrators, and regulatory oversight, all of them, with the exception of Big Bold. And by the original characterization of this initiative, it is not just an IOU program, it is really kind of that more holistic market transformation type of effort, that is how it was described in the original -- I do not know if it was a decision or Commissioner Gruenich's once you laid this out in May of '07 -- was it a decision? Okay, anyways. So we are talking a significant departure from traditional delivery mechanisms and legislative and other legal mandates. So there is uncertainty in how these savings are actually going to be delivered logistically. On top of that, so regardless of uncertainty in how those zero net energy homes programs are actually going to deliver --

who is going to do it, where is the money going to come from, etc. -- achieving those whole market targets for zero net energy home penetration which, for example, is 100 percent of all new residential homes will be zero net energy by 2020, that is the Big Bold target for the residential new construction sector -- 100 percent of all new construction in 2020 zero net energy. These are super aggressive from a technology point of view, from a vendor capacity and supplier point of view, from a program delivery point of view. So, ergo, it is reasonable to describe those savings outcomes that we have shown associated with the Big Bold Initiatives for zero net energy homes and buildings as highly uncertain. Since none of these delivery mechanisms exist, some of the technologies exist at a demonstration or pilot level, but you know, we did not try to model adoption, for example, explicitly. We modeled those savings as penetration weighted, technical potential -- it is hidden by that little thing there. So that is the last bullet on this slide, we will make sure that everybody reads it, right? To understand what the numbers are for what they are -- they are penetration weighted technical potential, assuming you get that level of market penetration in the new construction segment, and that is the best that we could do. The relative contribution of these things from an energy point of view, you could characterize as modest -- roughly 20

percent or a fifth from an energy point of view -- incremental uncommitted. From a peak demand point of view, this jumps all the way up to almost 45 percent by 2020 across all three initiatives. You know, 90 percent of the savings from the Big Bold Initiatives that we included as uncommitted programs are these zero net energy home initiatives -- or zero net energy homes and buildings, right? So that is what we are talking about. Zero net energy homes and buildings account for 45 percent of the total current estimate of incremental uncommitted peak demand savings by 2020. So, again, this is the other piece of the total pie, you know, where the outcome itself, the total outcome, is highly sensitive to this particular mechanism. And whether or not there are any adjustments for that or not, it is critical to actively monitor that market and to have some basis for actually measuring and assessing progress towards those specific goals on a regular and timely basis, and evaluate the likelihood of achieving the interim milestones and the ultimate milestones of those initiatives. So that is all I will say.

DR. KAVALEC: So how about we take a 10-minute break and be back here at 3:35?

(Off the record.)

(Back on the record.)

DR. JASKE: We have on the agenda about six

minutes, by my watch, for non-clarifying questions. So let's launch into those and we will see how it goes, and maybe we will take more than six minutes. If anyone has really complicated questions, you should probably come over here and ask it so it gets recorded, and so the people who are on WebEx can also hear.

MR. TING: Is this a wireless mic?

DR. KAVALEC: One other thing, if you do not get a chance to ask a question, or something occurs to you later, feel free to e-mail me. My e-mail address is on the presentation coming up and if I cannot answer it, I will be happy to ask Itron.

MR. TING: How about a show of hands of people who have questions. Is it just Tim and Rick? Does anyone not named Tim, Rick or Phil have a question? Anyone on the phone have a question? Apparently someone had a question on the phone, but we do not know if they are still there. Does anyone else in non-staff in the room have a clarification or a question on the technical analysis that we did? That is a no. So apparently someone on the phone had a question previously. Is this person still there?

MR. BERMAN: Yes.

MR. TING: Ah ha. Fire away.

MR. BERMAN: Can you hear me?

MR. TING: We can.

MR. BERMAN: Pardon? Hello?

MR. TING: Yes, we can.

MR. BERMAN: A couple of questions, a couple of areas, one is where you were talking about for appliance standards, but I did not hear any mention of the federal transformer efficiency standards that went into effect in 2010. Were those figured in any way into your analysis?

MR. TING: No. We were looking at efficiency measures on the customer side of the meter.

MR. BERMAN: So you are looking only at -- you are not looking at how generation of demand respond to efficiency on the DMV system at all?

MR. TING: No. So the exact list of federal standards -- we use the six-year rulemaking schedule that was available at the time of the '08 Goals Study as our basis for the assumptions about which standards would come when, and those are summarized in the Section 3 of the report. And so, if I recall correctly, this is -- the specific standards that we simulated were residential central air-conditioners, residential room air-conditioners, package terminal heat pumps, and package terminal AC units in commercial sector, and I am forgetting something I know -- residential dishwashers, I think.

MR. BERMAN: So it is only retail demand you are looking at, you are not looking at the effect on generation

itself?

MR. TING: Correct.

MR. BERMAN: So that might, in fact, be falling instead of rising.

MR. TING: Sorry?

MR. BERMAN: So would the effects of Smart Grid and so forth -- the results might be very different.

MR. TING: I would not venture to know.

MR. BERMAN: Okay. Then a question on your projections for providing lighting standards, my impression was that the savings with CFLs is about peaked out. Am I misinformed about that?

MR. TING: Peaked out in terms of market saturation?

MR. BERMAN: Yes.

MR. TING: Oh, I do not think so. You mean currently?

MR. BERMAN: Yes.

MR. TING: That the market is saturated with CFL's?

MR. BERMAN: Well, that there is basically been a huge conversion and that the savings -- that it is going to be about five at this point, at the current level?

MR. TING: I do not believe that is true.

MR. BERMAN: Okay.

MR. TING: So, just for clarity, the forecast that you saw for the low, mid, and high Goals cases, the IOU program piece of it, includes a substantial amount of savings from lighting measures, most of which is CFL's, but it also includes non-CFL measures, so we are talking Super T-8 linear lamps, lighting controls, other non-CFL measures. But CFL measures certainly account for a significant portion of that savings from IOU programs up until the time the Huffman standards become basically the baseline, which would obviate CFL's from being offered from IOU programs.

MR. BERMAN: So the savings from CFL's, whether they be part of the IOU program or part of the Huffman standard just continues to grow?

MR. TING: Uh, you could put it that way, yes.

MR. BERMAN: Is that realistic?

MR. TING: Based on the market saturation that I have seen, yes. Certainly we are far from market saturation for CFL's, especially in the residential sector.

MR. BERMAN: Okay, thank you.

MR. TING: You are welcome. Anybody else on the phone? Okay. All right, Rick, all you.

MR. ASLIN: Okay. Well, my name is Richard Aslin and I work for Pacific Gas & Electric Company, and I just wanted to say that I think a lot of good has come out of this analysis, and also the DFEEQP team that has gotten

together over the last at least year, and I think a lot of interesting observations have been made, and I do think that this kind of analysis, as difficult as it may be, to both do and to kind of review and try to -- I will use the word "critique," but not in any sort of harsh fashion -- I think it is worthwhile. So I have learned a lot over the last year. One thing that I did, though, when I got the report is I said, okay, well, there is a lot of stuff out there on energy efficiency and goals and all those kind of things, can I take some numbers that come from other sources and actually come up with something that really reconciles to the numbers that are being shown in this analysis? And really, one of the very first things that I did, I just went to the Goals decision, and I looked at that Goals decision, and I wonder if you could do something for me. Could you go back to that chart that had the table with the incremental uncommitted, especially the megawatts one? Yeah, that is the one. Thanks. Okay, so I am looking at the goals decision and that is decision 08-07-047, and specifically I am looking at the table -- it is table 82, Total Market Gross Goals - IOUs. And when I look at the total market gross goals, 2012 to 2020, the cumulative total market goals for that entire period, 4,542 megawatts, now I look at your analysis here for the mid case, and I see that just that incremental uncommitted is 5,352. And that is the first

place I started to get a little disconcerted. So if you could -- can you explain how to reconcile those?

MR. TING: So this has almost everything to do with the peaked energy factors that we used in the '08 Goals Study. The peak demand values that we calibrated to and for the Goals Study used '04 actuals, so '04 was a historically mild year. That is just the way it was, and we did not think to calibrate it to a forecast in a normal weather year for that exercise. These numbers are -- the peaked energy ratios reflect normal weather year as embodied in the '09 forecast for system peak demand from the '09 IEPR. Does that make sense? So the peaked energy factors -- so if you did the same comparison on energy, how did your comparisons look? Or did you not look?

MR. ASLIN: On the energy, they actually looked pretty close.

MR. TING: Right.

MR. ASLIN: Yeah, they looked pretty close, but I can understand how temperature --

MR. TING: It is related to the -- the '08 Goals Study used -- I will say unfortunately -- historically modeled weather year for the calibration year for peak. I mean, intuitively, does that interaction make sense to you, then?

MR. ASLIN: I understood what you said, I would

have to think about whether it intuitively makes sense, but I understand what you said.

MR. TING: Well, and the other thing to keep in mind is that the peaked energy factors for peak demand, particularly for Big Bold, make a big difference.

MR. ASLIN: Yeah, I will get to the Big Bold, I think that is another thing.

QUESTION FROM THE FLOOR: Have you run the numbers using the 2004 peaked energy ratio?

MR. TING: No, but I could.

MR. ASLIN: Did you have a slide that had the table that showed the -- yeah, I would be very interested in knowing this thing that Simon just mentioned, which was, you know, how much did the goals change? Because we have a decision, we had a whole process, and --

MR. TING: The energy numbers are almost exactly the same.

MR. ASLIN: Well, in my review, my quick review that I did, so do not hold me to this, but in the quick review that I did, I did not really have that much problem with the energy part of the analysis. It is actually pretty consistent with our understanding of energy efficiency with respect to energy demand growth, which is that, if you were not doing the energy efficiency, you probably -- your demand growth would be about 50 percent higher, or would be twice

as high as it is, so you get about a 50 percent offset in what demand otherwise would have been -- which is pretty close to what you are getting, and I just updated the forecast for Pacific Gas and Electric Company, and I ended up getting something that was pretty consistent with what would come out of this fully mitigated analysis for the energy, but I really am having a hard time with the peak capacity one because that is essentially -- I think you mentioned this -- it is essentially no growth in the base case, 2013 to 2020, and then it is negative growth in the peak, and during that same time the California economy, that is all hope, is going to grow, and we are going to add more people and I do not think we ever had a period in the history of California where we have not needed more energy in order to facilitate that sort of growth. So anyway, so that was one question -- can we reconcile the Goals decision with the mid case? So if people can think about how to do that, that would be good. And that is probably a question for the PUC as to how they want to handle that.

The other clarifying question I had was, on the Big Bold energy efficiency strategies, what I thought one of your slides said was that 90 percent of the peak savings in that category -- and that category was like 60 percent of total peak savings, I think --

MR. TING: Forty-five.

MR. ASLIN: Okay, so 50 percent of total peak savings, so about 50 percent of the incremental uncommitted peak savings have to do with one thing, which is zero energy homes and zero energy commercial buildings?

MR. TING: Uh huh, new commercial buildings, so both new construction.

MR. ASLIN: Right. And I am just wondering if maybe we could see a little bit more on that in terms of what was the assumption about how many homes that is, and kind of like where they are located with respect to climate zones, and all that kind of stuff.

MR. TING: Well, the driving assumptions are listed in Section 3. I could point you to the table.

MR. ASLIN: Okay.

MR. TING: Why don't I just do that. This is Section 3.2, and then the market penetration assumptions and the unit savings assumptions are in Table 3.1 and Table 3.2. And, you know, by their own characterization, by their own meaning, PUC, Commissioner Gruenich and staff via the strategic plan and various drafts leading up to the strategic plan that was adopted, they are aggressive, i.e., 100 percent penetration of Tier 2 homes in new construction by 2020, Tier 1 and Tier 2 and Tier 3 refer to the thresholds for the California Solar Homes Partnership, so to get in for those incentives, you have to do efficiency

first, and there is Tier 2 level and Tier 3 level. Tier 2 is 35 percent relative to '05 Title 24, Tier 3 is 55 percent relative to '05 Title 24. So we are talking, by 2020, 100 percent of all new homes are Tier 2, and 90 percent are Tier 3. That drives that result, entirely. That and the new construction rates are embedded in the '09 IEPR.

MR. ASLIN: Okay, so I just want to elude back here, this is just so we are clear on this. In the Goals decision, the one that I was just referring to previously, it does lay out even there what the megawatt savings are for Big Bold energy efficiency strategies.

MR. TING: We have the exact same scenario assumptions -- these are the same set as was used in the Goals Study, the only difference is the peaked energy factors.

MR. ASLIN: Right, but I just want to point out the vast difference here -- vast. It is like in the Goals Decision, it is like less than a thousand megawatts, and in your mid case, it is 2,000 megawatts, and in your high case it is almost 3,000 megawatts, so I think that is just really -- we have the thing that is the most uncertain which is driving the outcome. And I guess my final question --

MR. TING: Is that a question?

MR. ASLIN: No, that was a commentary. Editorial.

MR. TING: Sit down.

MR. ASLIN: You can delete that later. Just -- I did have a question about precision or accuracy of the work. Is there any statistical test that can be done to show what is the error band around these estimates of the incremental uncommitted?

MR. TING: No, not that is real defensible, I mean, we did not attempt to quantitatively bound uncertainty for this study. Now, in the Goals Study, we did low, mid, and high cases for every mechanism systematically, and we showed results for those bounded results for each mechanism, but when it came time to construct the straw man cases, to set goals, that previous matrix -- right -- ED staff shows -- right, we collaborated with them to come up with, okay, so we have low, mid, and high estimates for each of these mechanisms, and then we basically made choices for each cell to form the low, mid, and high case, but within a case it was not bounded itself by -- you know what I mean?

MR. ASLIN: Uh huh.

MR. TING: So -- yeah.

MR. ASLIN: Okay, thanks.

MR. TING: No attempt to quantitatively bound the results for a given Goals case was done for the Goals Study, or for this study.

MR. ASLIN: Okay, all right. And thanks very much. I really appreciate all the work you have done over

the last year or more on this, so -- and you know, I guess we have one or two more workshops to go.

DR. KAVALEC: So, excuse me, Tim, let's try to do two more questions so that we can get on to the rest of the workshop.

MR. VONDER: Okay, I am Tim Vonder with San Diego Gas & Electric. I kind of would like to offer a suggestion. In looking at your work, I think you did a very nice job, and I would give you an A-. And I think I would give you an A- because you followed the rules, but if you could kind of produce an additional scenario, break the rules and produce an additional scenario, I would probably raise it to an A. And what I have noticed is there is an inconsistency between what the Energy Commission staff did when they produced their forecast and what you did when you produced your analysis, and that is in the regard of taking this useful information from these ex post studies that were done on achieving savings from the IOU programs, and I think the studies that were ready and on the table at the time all of this was done was studies that involved savings up through 2005. And I think, if I remember correctly, the amount of savings that they adjusted it down to was approximately 65-68 percent of what was initially claimed as being achieved as to what was actually achieved. And then I think the Energy Commission used that information when they put

together their forecast, and they made some assumption then, using a realization rate of carrying that forward in some fashion for the rest of the committed programs up through 2012. But because of the rules that you were following, I think the PUC rules were that you were to assume 100 percent of total market achievable and so you assumed, I think, in your analysis that we would actually achieve everything that is stated here. And if you could produce a scenario that would at least, you know, assume something less than 100 percent achievable, and be more consistent with the way the Energy Commission did their forecast, that, I think, might be beneficial.

MR. TING: I understand your point, but for clarity, so you are talking about -- you are saying that the Goals scenarios and the underlying potential -- achievable potential forecast assume 100 percent realization rates.

MR. VONDER: Right.

MR. TING: That is not accurate.

MR. VONDER: Ah.

MR. TING: So they do assume 100 percent incremental cost rebates, but that is different from 100 percent realization rate from ex ante claims. Right? The realization rate is relative to an ex ante claim.

MR. VONDER: Okay, right.

MR. TING: So, just for clarity, the IOU portion

of this study, and the Goals Study, is based on '08 Itron potential updates that were conducted for the IOU's by Itron, using the asset model, the adoption forecast for all the forecasts of achievable market potential that come out of that asset study are calibrated -- were calibrated to all of the '04-'05 ex post results that were available at that time plus the -- it was not the full set, but the per unit kind of -- you could think of them as ex ante savings, you know, per unit ex ante savings assumptions for each measure. So, first of all, the adoption forecast was calibrated to observe the option rates, right, that were available from '04-'05 ex post evaluations. So in terms of forecasting, for example, adoption response to a certain level of incentive, those are actually calibrated to observe data from '04-'05. In terms of the savings assumptions associated -- per unit savings for measures, specifically measures, the '08 potential study used all of the -- you can think of them as most of them ended up being in the 2008 DEER, it was still '05 DEER at the time, but Itron was the prime contractor for the DEER Update Study, and so we incorporated all of the updated DEER data that we had available at the time of that, so we are talking -- I think this was circa 2007 when the final runs of those asset models were being produced, so we had preview of the major revisions to '04-'05 DEER that were reflective of actual

realization rates from '04-'05 ex post studies. Does that make sense?

MR. VONDER: So far.

MR. TING: So, therefore, the realization rates observed in '04-'05 programs were largely reflected in terms of per unit savings in the '08 potential forecast. In addition to that, the adoption rates themselves were calibrated to actual '04-'05 observations.

MR. VONDER: Okay.

MR. TING: So, in principal, although the methodologies in the two modeling frameworks are different, right, one is using a top down realization rate in the growth assumption, the other is using calibration to historical data, right? And the kind of DEER '08 preview data, if you will, that was available, that was ground in the realization rates in the '04-'05 cycle, right? It is just two different approaches to arriving at the same outcome, which is the actual expected savings from programs, not straight up ex ante claims. Right?

MR. VONDER: Okay, so --

MR. TING: Now, the extent to which one is higher, you know, more optimistic than the other, I cannot tell you because we did not strictly analyze that.

MR. VONDER: And I guess, then, to bring all of this together, and to kind of compare it to like what Rick

was talking about when he was saying, you know, these are the goals that are in Decision '07, okay, you are using efficiency measures that are different, possibly lower, let's say -- just assume lower -- than what was used to produce that Goals Study. So when we compare this to the Goals Study, there is a -- I do not know -- we are more than meeting the Goals? I am not quite sure where that goes. If the Goals were built on a measure of efficiency that is higher than the measure efficiencies that you used in your analysis, where does that take us?

MR. TING: The only thing that is different is the peaked energy factors for residential end uses, which we talked about already, we have slightly lower total forecasts in the growth in housing stock, the commercial floor stock, than before. So those -- one is an upward adjustment, one is a downward adjustment. We had some slight revisions in space heating UEC's, but you do not really -- those do not manifest themselves very much in these results, particularly the peak results, they are zero. We did revise the base UEC for space cooling in SDG&E, I think it went up, so that is an upward revision to the peak results, for sure. But in terms of why we use this adjusted set of scenario assumptions versus the Goals Study, I would direct you to the clients and not the contractor.

MR. VONDER: All right. But, I guess, just then

in summary, what you are saying is that you did really make some adjustments like the forecasting staff did when they adjusted downward the realization rate. You made some similar adjustments, but at a more detailed level in terms of measured efficiency --

MR. TING: It is just a different approach to try to simulate the same expected value outcome. One is the direct application of realization rates net to gross ratios, the other is to calibrate to observed adoption and use savings inputs that reflect the best knowledge of realization rates to date, and incorporate that already on the front end.

MR. VONDER: Okay, thanks.

DR. KAVALEC: So we can take one last question.

MR. GOLDSTONE: I have a question, but I have a rhetorical question, so it will be short. And actually, I want to blame Mike Ting for this question because you said something earlier -- I am not going to ask you this question, okay? But you inspired the question. So I am going to ask the question for all of the modelers. You said earlier -- I forgot who was asking you -- but you said it would not be defensible -- someone was asking if you could come up with a bound of uncertainty and you said it would not be defensible. Did I get you right? You said something like that.

MR. TING: Someone asked me to put a quantitative bound on uncertainty and I could give you one, but it --

MR. GLADSTONE: But you used the word that it was not "defensible." That is what caught my --

MR. TING: And off the cuff.

MR. GLADSTONE: It is interesting you said that because we are in a project in which we are trying to evaluate the demand modeling methodologies at the Energy Commission, and we have a framework, and our framework says it is not defensible to put forth a point forecast unless you can give the policymakers some idea of the bound of uncertainty, because if you do that the policymaker might believe your point forecast, despite all your caveats and be badly misled. So my question to the modelers is do you think our framework is right or wrong? And let me know because that is the one we are applying. And a related point, which makes me think the framework is right, is if I think of what models and modelers can do -- and, by the way, I have a lot of respect for computer modeling, in my youth I used to do it and I learned a lot from computer modeling, so I know you can model that -- but one of the things that I think computer models can do, that human brains cannot do, is deal with complex interdependencies, and what we have here -- all these different uncertainties, you know, like the decay uncertainty, the price uncertainty, the economic

growth uncertainty, these are interdependent with one another. So if you look at each one, if you look at each uncertainty one at a time and you try to add them up to get a bound uncertainty, you way exaggerate the uncertainty. But if you think hard about the interdependencies and try to nail those down, you will learn a lot about real uncertainty. And I think if you use models in that way, you will in fact be able to come up with some defensible -- not only defensible, but downright insightful and useful ideas about how to bound uncertainty. So that is where I am in my thinking, that is where we are in our thinking, so I am inviting any of you modelers to communicate your thoughts on that. I am looking for help because I feel bad, I am at odds with one of the best modelers here, and he tells me one thing, and I am in a totally different thing, so I am worried now.

MR. ASLIN: My comment on that would be, yes, I agree, there is a lot more to looking at a distribution than looking at the expected value. You have to have the uncertainty bounds, but I would go beyond that and say the other really really crucial thing is it has to be verifiable, you have to be able to give your model to another person, and that person has to be able to run your model and get the same result that you got. I want verifiability and transparency.

MR. GLADSTONE: You want the bound of uncertainty and stability for someone else to verify your bound of uncertainty.

MR. ASLIN: Yes.

MR. GLADSTONE: Okay.

DR. KAVALEC: Okay, so let's move on. I have a real quick slide presentation here. Okay, first off, I want to mention something I should have mentioned before for those that have not been through this process. We ask that questions or comments be submitted to our Dockets Office, and if you look in the announcement for the workshop, it gives you specific directions on how to do that. And, as I said, if any additional questions crop up in the next few days, there is my e-mail address, I will try to handle those. Also, I want to acknowledge the tremendous amount of work that Itron put into this and thank Mike for a great presentation on a very difficult subject.

Okay, so I want to just give a little bit of perspective on the numbers that Mike has presented this afternoon, starting with the 2009 IEPR forecast itself, and then looking at how incremental uncommitted savings look relative to the total forecast, and how these incremental uncommitted savings look relative to the total committed savings in the forecast.

Okay, in terms of getting eventually to a managed

forecast, which is the CPUC's goal, we are starting off at a lower point than we were versus our 2007 forecasts. This first draft shows for the three IOU service territories combined electricity sales forecasts for the 2009 forecast and the 2007 forecast, and you will notice quite a difference between the two, around 7 percent lower in -- that should actually say 2018 because the 2007 forecast does not go up to 2020 -- and that comes from more pessimistic economic projections, more efficiency, higher electricity rates, a 15 percent increase in this forecast versus flat rates in the last one, and more self-generation. And here is the same thing for peak, again, a lower forecast versus 2007, but not as big a difference, only 5 percent lower -- again, that should be 2018 -- and the reason for that is that, just from observation, we have seen in the last year or so that peak demand has not been dropping as quickly as total energy demand, or total consumption.

Okay, so next, here is what the three scenarios look like compared to our 2009 IEPR forecast for the three IOU's combined. The three lines below the green line starting in 2013 are what our forecast would have looked like had we incorporated these incremental uncommitted impacts into our sales forecast. So they would constitute by 2020 a 5-7 percent reduction. Now, again, this is not a complete -- this is not the end of the story because, to get

to a managed forecast, you also have to take into account other types of demand side resources like additional self-generation. And for peak, as we have seen, much larger impacts. You can see in the red, the mid case, and the black, the high case. We have zero or negative peak growth, 8-12 percent reduction in 2020 versus our peak forecast for the three IOUs combined. And that was due as Mike pointed out mainly to the Big Bold assumptions regarding the Big Bold Initiatives and its impact. And committed savings -- here is the committed savings that are included in the 2009 IEPR forecast for the three IOUs combined, broken out by category. And these, we tracked back to 1975, so on the left-hand side of the graph, which did not come out very well, it starts with 1990, and we already have savings above zero, and that is because we track savings all the way back to 1975. So you have an accumulation of appliance standards and building standards, particularly, from the mid-'70s.

And now these incremental committed savings for the mid case scenario stacked on top of our total committed savings from the previous graph, and you will notice a line in the middle there, that allows us to compare incremental committed impacts with incremental uncommitted impacts, starting in 2012, and you will notice that, by the time we get to 2020, the two are roughly the same -- incremental, uncommitted is roughly equal to additional committed impacts

that are in the forecast during that period.

And finally some other issues. This was going to include more elements, but we left most of those for the Next Steps presentation at the end. So we are left with other elements of uncertainty. Mike spent a lot of time talking about specific technical uncertainties and these are sort of more general technical uncertainties. First of all, rates. We assume one rate forecast behind this analysis that is a 15 percent increase between 2010 and 2020, and we do not look at the implications of other rates. There are many that forecast a rate increase of 30 percent or more in the next 10 years, and that would presumably affect what the CPUC decides in terms of how aggressive to be on energy efficiency programs since higher rates would be more "naturally occurring savings." And also, yes, there is the uncertainty related to what price response actually is, so you have got to throw that in there, too.

Second, reliance on voluntary programs, we are sort of in unchartered waters here, we are really ramping up voluntary IOU programs, which rely on voluntary activities, and it could be that we have already picked all the low-hanging fruit, and it is going to be much more difficult to get additional savings than we assume.

Economic uncertainty is just a reminder that we live in very uncertain economic times. And we have

attempted to account for policy uncertainty in doing the three scenarios, but we did not incorporate economic uncertainty. This analysis is based on one economic forecast. A more perfect analysis with more time would have incorporated different economic scenarios, and included that as part of the analysis. So that is something to think about for next time.

Model reconciliation, I just wanted to reiterate Mike Ting's point about the importance of consistency across all of our models. This lack of consistency created uncertainties that would not have been there had we had a more integrated approach, and a more integrated approach is our goal for the next round of this work.

Okay, let me ask now, are there any other public comments that folks want to make? Sure, go ahead.

MR. ASLIN: Richard Aslin, Pacific Gas & Electric Company. So what I wanted to just clarify was that the rate projection that is used in the base case forecast, and also in the incremental uncommitted analysis is a 15 percent increase in real rates, which translates roughly into a 40 percent increase in nominal rates. Is that your understanding of that, Chris?

DR. KAVALEC: Depending on what you assume about inflation.

MR. ASLIN: I was just going to assume inflation

is 2.5 percent per year on average.

DR. KAVALEC: Okay.

MR. ASLIN: Okay. The other kind of -- I do not know if you have this or not, but if you go back a couple of slides, one more, that one. Do you have that same slide for the peak?

MR. KAVALEK: No, I do not, unfortunately.

MR. ASLIN: All right --

MR. KAVALEK: But it would be very similar. The dark blue would be a little bit larger because of higher peak impacts.

MR. ASLIN: Okay, so there is some significant portion of energy efficiency savings in the uncommitted period that is already embedded in the base case forecast that was adopted?

DR. KAVALEC: The only what you could call uncommitted savings that were in the IEPR forecast were those additional residential lighting savings. And also naturally occurring, or price effects.

MR. ASLIN: Okay, so let me --

DR. KAVALEC: So everything else was included in the Itron analysis for uncommitted, but not included in the IEPR forecast.

MR. ASLIN: All right, maybe I am just getting hung up on the terminology here, so in this period where

there is a dark blue and a light blue, the light blue that is above the line, how would you characterize that? It says committed savings, so I am taking that to be -- it is embedded energy efficiency savings that take place in the uncommitted period, but are due to current program standards.

DR. KAVALEC: Yeah, additional residential lighting savings, and do not forget we have a 15 percent rate increase going on between 2010 and 2020, which is creating savings.

MR. ASLIN: Okay, all right. Because I mentioned this to you yesterday, but I was looking at the tables in the forecast report, the California Energy Demand Report, and one of those tables showed, or it looked like it showed, here is the amount of energy efficiency that is embedded in the baseline forecast; and for the peak forecast, when I added that up, I got something that was pretty close to 1,350 megawatts.

DR. KAVALEC: Right, yeah. And the reason that is not directly comparable is because this is all incremental to 2006, whereas those numbers that you were looking at, embedded in the forecast, are relative to 1975. So this is just what is incremental to 2006. What did I say? Right, I am saying in the incremental case, it is relative to 2006.

AUDIENCE MEMBER: Right, but in the committed

savings for, say, 2016, it assumes you replace something by 2016 with a 1975 appliance.

DR. KAVALEC: Right, which is -- that is what I was attempting to say. It is relative to 1975, so it is not directly comparable.

MR. ASLIN: Okay, I will have to give that some further thought. Thanks.

DR. KAVALEC: We can talk about it some more if you want. Okay, if there are no other public comments -- yeah, okay, we have a WebEx comment.

MR. NABAVI: Hello?

DR. KAVALEC: Faramarz?

MR. NABAVI: Yeah, can you hear me?

DR. KAVALEC: Yeah, go ahead please.

MR. NABAVI: I have a few questions with respect to the IOU programs and Itron's classification. So my questions are pertaining to the previous presentation. First, I am wondering, with respect to the IOU program relative to the other categories, why is it that IOU programs have a much higher gigawatt hour/megawatt ratio versus other programs?

DR. KAVALEC: Michael, answer your question.

MR. NABAVI: Please speak up because the audio is very very faint.

MR. TING: Okay, this is Mike Ting. The general

answer is that the load shapes of the measures in the IOU portfolios on average are more flat, right, because you have to look at most of the portfolios is residential/commercial lighting, for example, or industrial measures, and those are associated with end uses that have a relatively flat load shape as opposed to the Big Bold Initiatives that are really focused on HVAC, which is a very peaky end use and produces relatively high peak savings compared to energy savings. Does that make sense?

MR. NABAVI: That does, and I can barely hear you, but I understood what you said. And then, in terms of categories of Title 24 and IOU programs, which ones of these have already had a period of implementation? That is -- let me rephrase that -- which ones of these are there already actual results in data that have been collected for prior periods -- projections and forecasts?

MR. TING: Do you mean -- so, well, I think the answer is only the '06/'08 IOE programs. You are saying is there any type of verification data used to verify any of these forecast numbers? Is that what you are asking?

MR. NABAVI: Right, just being able to understand -- are these forecasts that are based on best available assumptions? Or is there a historical experience for any of these programs that, you know, for example, may have been -- when I look at the graph, I see that the --

MR. TING: I am sorry, I did not catch the tail end of what you just said.

MR. NABAVI: I am sorry. So for various categories of Title 24 federal standards and the Huffman Bill, those appear to begin in 2010, and --

MR. TING: Correct. And your question is, is there any evidence that the Big Bold --

MR. NABAVI: There is no data on any of those.

MR. TING: For Big Bold, you are definitely correct, that is something we tried to cull out in the uncertainty sections specific to the Big Bold Initiatives, is that there is very little tracking data relative to penetration of zero net energy homes in the new construction market to validate any of those assumptions in the early part of the forecast.

MR. NABAVI: Okay.

MR. TING: Now, to be clear, for the IOU portion, there will be shortly a pretty comprehensive set of ex post evaluations of the '06-'08 program cycle that could be used in principal to validate some of the forecasted numbers for IOU programs through that same period that you see in this study. It is important to know that the IOU portion, which comes out of the previous Itron assets modeling study, those adoption forecasts were calibrated to actual observed adoptions over the '04/'05 program cycle, specifically.

MR. NABAVI: Right.

MR. TING: Right, so it is important to understand that they are not strict ex ante, some forecaster in blocks just drawing lines out. Those -- the adoption functions were actually calibrated to observed '04/'05 program data.

MR. NABAVI: Why is it that the IOU programs, the blue portion, if you will, that is included into the adopted forecast -- why is it that drops off after 2012? I am sure it is your materials somewhere.

DR. KAVALEC: That just represents the fact that, by committed savings for the IOU programs, that means we are only included IOU program impacts through 2012. There are no new program impacts beyond that period in our IEPR forecast, so what happens after that is you see the decay as measures wear out.

MR. NABAVI: Basically what that is saying is, for example, this is the result of the implementation of IOU programs up to 2012, so there will still be savings associated with, for example, CFLs that were distributed by IOU's up to 2012.

DR. KAVALEC: Yes, that is right.

MR. NAVAVI: Thank you very much. I appreciate it.

DR. KAVALEC: Okay, thank you. Okay, so we will close with a brief presentation on Next Steps.

DR. JASKE: Okay, so you have this hand-out, I am not going to go into it in any gory detail. In the immediate time horizon, of course, we have asked for comments, I guess, if I am recalling our dialogue correctly, we are now requesting that you provide them by February 10th, as opposed to February 5, which is what it says here, and earlier we had said the 8th, so February 10. There is, of course, the IEPR Committee Workshop, or IEPR/Electricity and Natural Gas Committee Workshop on the 17th and, as Chris said earlier, there will be -- or at least it is our expectation that, connected with the agenda will be some questions that the committee itself is sponsoring to help frame the discussion in that workshop. Of course, following that workshop, we will get some direction from the committee about how to modify the staff report, we will take some time to do that, and we will be then transmitting that final package to the PUC for them to take the next steps in their process. And there are, of course, some hints about what those next steps are in Appendix C, I believe, of the Staff Report.

So then, you know, in the time horizon beyond that, part of the current Energy Commission contract with Itron is to get some training and, as part of that, get some documentation, more formally organized, about how to run it and interpret its results, and we are going to be attempting

to implement that tool for a publicly owned utility because, as has been noted, the work funded to date only deals with the three IOUs. And the PUC and Energy Commission have agreed to release this current version of SESAT with the documentation, such as it will be, within the limits of our contract publicly, and if that proves to be insufficient, then somebody somewhere is going to have to find some more funding to improve upon that.

Then, stepping somewhat back from the particulars of this study and SESAT is the question of the working group and identifying some candidate areas of focus for that over the course of whenever, and of course eventually getting concrete and focusing on the 2011 IEPR cycle. I think there is obviously in this last point quite a number of things floating around that the next round of the PUC's goals process is going to have to deal with, so once that gets framed and launched, which I understand will be in this calendar year, to be completed in 2011, then that becomes a particular formal forum for resolving perhaps some of what we have been talking about today.

And then, over the longer haul, of course, there is a number of fundamental methodological issues that we need to be thinking about, you know, how do you interrelate wholly separate models? Is there some other model out there that does all of this in some more integrated way? Can the

current models be adapted to more clearly be harmonized to one another? Energy Commission has a bunch of sort of feeder models that have been run, have been prepared and run from time to time, that are the source of some of the inputs that go into the main forecasting models, and at that level, you now, we are getting into measure level impacts. But they are not nearly as comprehensive even as what Itron has now, and perhaps we should be thinking about getting rid of those and making more use of asset or some other more holistic measure type model ourselves.

And somewhere downstream, I am sure Management is going to be asking us to think about the analogue to this effort for the other aspects that are demand side policy initiatives, the distributed generation, whether rooftop, PV, or other things, as long as it is on the customer side of the meter, anyway, the DR, the CHP, whatever. So there is a host of things of that sort that collectively are also -- at least in concept -- parallel to this energy efficiency effort that the policymakers are driving toward and establishing goals for, but for which there are, at best, only crude understandings of what their demand impacts are, and no holistic way to bring all of that together. And clearly, Appendix C written by the Energy Division staff, you know, conceptually says all of those things need to be taken into account in the forthcoming LTTP cycle. But if

there are not good analyses already underway now, then the timing is not going to pay out well. But clearly that is some sort of a growth area, so to speak, over the longer haul. And some fragment of all of that will, of course, be attempted for the 2011 IEPR cycle.

So I guess cycling back to this slide, you know, creating a laundry list of potential areas of focus for our existing working group, and trying to get some buy-in from folks about what is most important, you know, what collectively we want to put some resources into, that is a dialogue that we should start having soon because I do not think there is any need to wait for that for any major policy decision to get made, we are just wasting time. We need to sort of get on with all of the background things that we, as analysts and forecasters, can do so as to be as far along as we can in the next cycle that we need to have these materials available to the decision makers. So that is all I had to say. Anyone have any final comments they want to make or observations? Okay, well, we will see a lot of you again on the 17th. Thank you very much.

(Whereupon, at 4:44 p.m., the workshop was adjourned.)

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CERTIFICATE OF REPORTER

I, PETER PETTY, a Certified Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Workshop; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said meeting, nor in any way interested in outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this _____ day of February, 2010.

_____
PETER PETTY