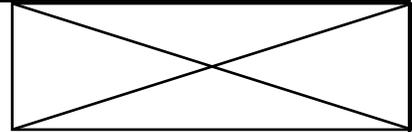




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NUMBERED 1 THROUGH 77

STATE OF CONNECTICUT  
DEPARTMENT OF ENERGY AND  
ENVIRONMENTAL PROTECTION  
BUREAU OF ENERGY AND TECHNOLOGY POLICY

2013 - 2015 Conservation and Load Management  
Plan - SBEA Impact Evaluation

Technical Meeting held at the Department  
of Energy and Environmental Protection, 79  
Elm Street, Hartford, Connecticut, on June  
10, 2014, beginning at 10:00 a.m.

H e l d        B e f o r e:

DIANE W. DUVA,  
Hearing Officer

1     A p p e a r a n c e s :

2             For DNV GL:

3                     THOMAS LEDYARD

4                     \*THOMAS FRANKS

5                     \*KENNETH AGNEW

6

7             For Northeast Utilities:

8                     GEOFFREY EMBREE

9

10            For UIL Holdings:

11                    PATRICK MCDONNELL

12                    ROY HALLER

13                    \*DENNIS O'CONNOR

14                    \*MICHAEL GHILANI

15                    \*DICK OSWALD

16

17            For PURA:

18                    SERA EVALUATION CONSULTANT TEAM

19                    \*LORI LEWIS

20

21            For Greater New Haven Chamber of

22            Commerce:

23                    \*AMY THOMPSON

24

25

1    A p p e a r a n c e s:  (Cont'd.)  
2            F o r  t h e  C o n n e c t i c u t  E n e r g y  E f f i c i e n c y  
3            B o a r d:  
4                    L E S  T U M I D A J  
5  
6            F o r  C B I A:  
7                    E R I C  B R O W N  
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24  
25    \*  P r e s e n t  b y  t e l e p h o n e .

1 MS. DUVA: Yes, let's start  
2 the record. So we're recording and  
3 transcribing this meeting because it is an  
4 evaluation effect meeting.

5 Are we good? Okay.

6 So today is June 10, 2014.  
7 And here in Hartford, in the Ensign Room, we  
8 have an evaluation report being presented by  
9 Tom Ledyard.

10 And we have other people who  
11 are in the room in Hartford and people on the  
12 telephone.

13 I am Diane Duva of the  
14 Department of Energy and Environmental  
15 Protection.

16 We have Tom Ledyard of --

17 MR. LEDYARD: DNV GL.

18 MS. DUVA: Thank you.

19 And we also have -- go ahead  
20 and identify your name and your affiliation.

21 MR. EMBREE: Geoff Embree with  
22 Northeast Utilities.

23 MS. DUVA: And also?

24 MR. HALLER: Roy Haller,  
25 H-a-l-l-e-r, UIL Holdings.

1 MS. DUVA: And we also have a  
2 consultant for the committee?

3 MR. TUMIDAJ: Les Tumidaj with  
4 the Energy Efficiency Board, the C and I  
5 consultants.

6 MS. DUVA: And on the  
7 telephone, go ahead, Amy.

8 MS. THOMPSON: Amy Thompson,  
9 Greater New Haven Chamber of Commerce.

10 MS. DUVA: Okay.

11 And we also have Mike?

12 MR. GHILANI: Yeah, Mike  
13 Ghilani with UI, United Illuminating.

14 MS. DUVA: We also have Tom  
15 Franks.

16 Go ahead, Tom.

17 MR. FRANKS: Tom Franks, DNV  
18 GL.

19 MS. DUVA: And then --

20 THE COURT REPORTER: Can you  
21 give me one moment. I'm having a small  
22 technical difficulty.

23 MS. DUVA: Sure. We're going  
24 to pause to let the court reporter get the  
25 computer operational.

1 THE COURT REPORTER: Please  
2 excuse me.

3 MS. DUVA: That's okay. But  
4 I'll take the opportunity just to say there's  
5 a couple of other people who called in but we  
6 don't know your names.

7 (Pause.)

8 THE COURT REPORTER: I got it.  
9 Thank you.

10 MS. DUVA: Okay. We're good.

11 So I think where we left off  
12 was Mike Ghilani was identifying himself and  
13 his affiliation. Okay.

14 So Mike Ghilani of United  
15 Illuminating.

16 We also have Tom Franks. Go  
17 ahead and say your name. This is because  
18 we're just getting back to putting this on  
19 the record. Go ahead and say your name, Tom  
20 Franks, again.

21 MR. FRANKS: Tom Franks, DNV  
22 GL.

23 MS. DUVA: Okay. Go ahead,  
24 Lori.

25 MS. LEWIS: Lori Lewis on

1 behalf of the PURA, SERA Evaluation  
2 Consultants.

3 MS. DUVA: Okay.

4 And go ahead, Ken.

5 MR. AGNEW: Ken -- Ken Agnew,  
6 DNV GL.

7 MS. DUVA: Okay. Go ahead,  
8 Dennis.

9 MR. O'CONNOR: Dennis  
10 O'Connor, small business administrator, UI  
11 Company.

12 MS. DUVA: Who else has joined  
13 us on the telephone?

14 MR. OSWALD: Dick Oswald from  
15 United -- UI Planning.

16 MS. DUVA: Great. Thank you.  
17 Mike, tell where you're from.

18 MR. EMBREE: He's from UI as  
19 well.

20 MS. DUVA: UI? Okay.

21 And then also in the room, we  
22 have -- go ahead, Eric.

23 MR. BROWN: Eric Brown, with  
24 the Connecticut Business and Industry  
25 Association.

1 MS. DUVA: Okay. We can  
2 begin.

3 Go ahead, Tom.

4 MR. LEDYARD: Okay.

5 Thank you, everyone for -- for  
6 calling in or joining us here in Hartford. I  
7 appreciate the opportunity. I always enjoy  
8 the opportunity to present the impact  
9 findings, especially in my home state.

10 I work out of Middletown,  
11 Connecticut. I have two colleagues on the  
12 phone, Ken Agnew from Wisconsin, who was  
13 instrumental in -- in helping me piece  
14 together the billing analysis work that we'll  
15 discuss, and Tom Franks who's involved in a  
16 great deal of other Connecticut evaluation  
17 work and had interest in understanding this  
18 process and -- and hearing the presentation.

19 One of the other people I  
20 wanted to call out is Jeff Zinda. He is  
21 in -- also in the Middletown office, and he  
22 was instrumental in coordinating and  
23 overseeing a lot of the metering and  
24 verification work that we did, which was a  
25 big part of the evaluation.

1                   The evaluation we did was on  
2     the 2011 program year of the small business,  
3     or SBEA Program. The evaluation began in the  
4     summer of 2012. The metering occurred  
5     between October of 2012 and October of 2013.  
6     And the final report has been completed and  
7     filed. We received comments from both UI and  
8     CL&P on that document. We addressed those  
9     comments, and that report is now considered  
10    final.

11                   The presentation itself will  
12    largely mimic the report. I'll go over the  
13    study goals and objectives that were laid out  
14    at the outset. I'll go over the activity or  
15    what the program tracked in savings for the  
16    2011 program year. I'll review the  
17    methodologies that we employed to evaluate  
18    the study, and then I'll go over the study  
19    results.

20                   And there's really three  
21    sections of this that I'll go over. The  
22    first one will be the on-site with the  
23    metering that we performed. The second will  
24    be review of the PSD that we performed, or  
25    the document that -- that drives the energy

1 savings estimates. And then the third one  
2 will be will be the billing analysis. And  
3 then I'll, at the conclusion, I'll talk about  
4 our final conclusions and recommendations.

5 And there are -- they're 25  
6 slides, so if you want to keep track of how  
7 far along we're going, I don't anticipate  
8 this being more than 30 to 40 minutes.

9 The studies and objectives,  
10 there were two primary studies -- objectives  
11 of the studies. The first one is to estimate  
12 a program level electric gross savings  
13 estimates, plus or minus 10 percent precision  
14 at that 90 percent level of confidence.  
15 That's sort of a standard target, a precision  
16 target for evaluation studies in the  
17 industry. The second was around energy  
18 savings. The second goal was to estimate  
19 SBEA electric demand savings or peak demand  
20 savings coincidental for summer on peak and  
21 seasonal peak, at plus or minus 10 percent at  
22 the 80 percent confidence -- level of  
23 confidence.

24 This is more -- this goal  
25 drives from essentially ISO New England FCM

1 submission requirements that -- that requires  
2 that DRVs put into the forward capacity  
3 market and meet 80/10 criteria overall. So  
4 that's why this one is so important.

5                   And so, one of the other sort  
6 of subcategories, or sort of a subgoal that  
7 we had along the way was to disaggregate  
8 results from measures with sufficient sample  
9 size and provide primary realization rate  
10 discrepancies. And let me talk about that  
11 for a moment, in that, for many years, we  
12 would provide realization rates, which is  
13 simply the relationship between what we find  
14 in our gross savings estimate and evaluation  
15 and what's been tracked in the tracking  
16 savings and in the tracking system at the  
17 utilities. And that's the realization rate.

18                   And what it used to be, we  
19 would simply provide a realization rate, and  
20 it would be 80 percent or 90 percent or  
21 110 percent, so whatever it might have been,  
22 and we wouldn't have -- and then we would  
23 provide information on what drove those  
24 realization rates, but it wouldn't be  
25 terribly quantitative.

1                   So one of the things we're --  
2 we've been doing the last several years is  
3 providing sort of the changes in savings that  
4 occur that drive the final realization rate.  
5 And I'll show you more about that in a  
6 moment. But it helps sort -- when you're  
7 talking about improving program impacts and  
8 program designs, it helps you figure out  
9 where -- where the issues lie in improving  
10 realization rates in the future.

11                   And then, finally, one of the  
12 things that we sought to do was to provide  
13 recommendations to update the current PSD  
14 with results from the study. You know, the  
15 typical program evaluation cycle has  
16 implementation, and then we come in and  
17 evaluate, and then we provide recommendations  
18 that then help improve realization rates.

19                   Well, inside that, you have  
20 this PSD document in which the more that  
21 PSD -- in which you try and have impact  
22 evaluation findings also inform changes to  
23 the PSD. And the idea here is that, as the  
24 PSD becomes more and more refined as more and  
25 more evaluation cycles occur, your

1 realization rates become better and better.  
2 You become better able to track more accurate  
3 energy savings and more refined energy  
4 estimates moving forward.

5 MR. BROWN: Tom, just two  
6 quick questions at the outset. One --

7 MS. DUVA: Eric, could you  
8 identify your name for the court reporter?

9 MR. BROWN: Oh, I'm sorry.  
10 I'm sorry. Yeah. Eric Brown.

11 MS. DUVA: From the CBIA.

12 MR. BROWN: First -- first of  
13 all, acronym alert?

14 MR. LEDYARD: Oh, I'm sorry.

15 MR. BROWN: PSD is?

16 MR. LEDYARD: Program Savings  
17 Document.

18 MR. BROWN: Okay.

19 And secondly, can you just  
20 give a quick understanding of what the  
21 universe of facilities we're talking about  
22 that are in the SBEA program?

23 MR. LEDYARD: Yeah. Yeah, I  
24 can. So there's small business. I think  
25 it's -- oh, I don't remember what the

1 criteria was. It might have been -- Goeff,  
2 do you know what's the criteria of the small  
3 business?

4 I should know it offhand.

5 MR. O'CONNOR: If I can jump  
6 in? Dennis O'Connor.

7 It's up to 200 kW of demand  
8 use. What that equates to roughly is  
9 anywhere between a 22 to 25,000 dollar a  
10 month electric bill. So anything below that,  
11 that falls under commercial, we wouldn't do  
12 the -- the large grocery store, such as Stop  
13 & Shop or the IGA markets, midsize  
14 manufacturing all the way down to little  
15 bodegas.

16 MR. BROWN: Great. Thank you.

17 MR. LEDYARD: Right. And, in  
18 fact, the types -- and it comes up on another  
19 slide -- the types of sites that we visited  
20 were retails, restaurant, medical offices,  
21 office buildings, you know, regular small --  
22 small office buildings kind of thing.

23 Yeah. And I apologize for  
24 the -- the jargons.

25 So this is the 2011 program

1 year activity. And, you know, as you might  
2 expect, among this -- among this important  
3 population, you know, a fair amount of the  
4 savings, the bulk of the savings is in  
5 lighting. And it's, you know, 80 percent  
6 regular lighting, and then CL&P had another  
7 7.2 percent of what was referred to as  
8 "high-performance lighting."

9           But refrigeration is actually  
10 making a reasonable -- refrigeration has been  
11 creeping up over the years as more and more  
12 folks have put on that measure type. I've  
13 been evaluating small business programs for  
14 quite a while. And in fact, this year there  
15 was a talk at the -- at the program when  
16 we're -- when we were trying to lay out the  
17 design of the evaluation, whether or not we  
18 wanted to focus more on refrigeration, other  
19 measure types than lighting than we had in  
20 the past because it is becoming more  
21 important.

22           One thing I'll note is that  
23 NEEP is actually doing a refrigeration load  
24 state study right now, so that -- that sort  
25 of takes some of the impetus off the need to

1 do, you know, a focused study on that measure  
2 type in Connecticut.

3 THE COURT REPORTER: You said  
4 NEEP?

5 MR. LEDYARD: Northeast Energy  
6 Efficiency Partnership.

7 THE COURT REPORTER: Thank  
8 you.

9 MR. LEDYARD: Well, this is  
10 just a fun graphic, I guess, more than  
11 anything else. One of the things we do like  
12 to do is just get a sense of where all the  
13 program savings are occurring. And as you  
14 might expect, they do occur in larger towns  
15 and cities where there are more customers.  
16 But still, the breadth of the program  
17 coverage across the state is actually -- it's  
18 very good, from sea to shining sea kind of  
19 thing.

20 MR. HALLER: So Tom, what does  
21 the red categorize?

22 I -- I wasn't -- when I was  
23 looking at the actual slides --

24 MR. LEDYARD: Uh-huh.

25 MR. HALLER: -- I didn't see

1 any reds in your legend.  
2 MR. LEDYARD: Any reds?  
3 MR. HALLER: I mean, all  
4 around the Hartford area --  
5 MR. LEDYARD: Yeah.  
6 MR. HALLER: -- I'm seeing  
7 what appears to be red.  
8 MR. EMBREE: Yeah. It's  
9 green. Sorry.  
10 MR. LEDYARD: Oh, in the  
11 picture?  
12 MR. HALLER: Okay. So is --  
13 is that color the same as the greater than  
14 300,000-kilowatt hours?  
15 MR. LEDYARD: Yeah. I think  
16 so. Yeah.  
17 MR. HALLER: Okay. Then we're  
18 good.  
19 MR. LEDYARD: Yeah.  
20 MR. BROWN: You're seeing red?  
21 MR. HALLER: Yeah. Hartford  
22 is red.  
23 MR. LEDYARD: Oh, I see  
24 Hartford.  
25 MR. BROWN: Okay. You need to

1 get your eyes checked.

2 MR. LEDYARD: So on-site  
3 methodology. So one of the -- so there were  
4 two -- as I discussed earlier, there were two  
5 primary evaluation methods that we -- that we  
6 used in the study. One of them was on-site  
7 with metering and verification, and one of  
8 them is a billing analysis. And typically,  
9 you know, I think of these conceptually as  
10 the on site with metering verification is a  
11 bottom-up study. Billing analysis is more of  
12 a top-down study.

13 So this is the bottom-up  
14 study. And one of the first things you do  
15 when you do an on-site approach is you do a  
16 sample design. So you take that population  
17 that you saw earlier, two slides ago, and you  
18 figure out which of those you want to  
19 statistically select to go visit on-site and  
20 perform metering and verification.

21 And so we did a couple of  
22 iterations of a sample design, and this is a  
23 final one that we used. And what you'll see  
24 is I -- we -- because we're trying to have  
25 two goals, we're trying to get energy savings

1 of plus or minus 90 and peak demand savings  
2 at plus or minus -- at -- at 90 plus or minus  
3 10, and peak demand at 80 plus or minus 10,  
4 we had two -- I was interested in having two  
5 sort of slices of the sample design. The  
6 first one on the top half is energy savings.  
7 The bottom half is the summer peak demand  
8 savings.

9                   And so what you see here is  
10 that we -- we tried to target 90 that -- on  
11 the energy savings, where we targeted plus or  
12 minus 8.6 percent at the 90 percent  
13 competence interval, and on peak demand we  
14 target -- we try to get a 9.5 percent. The  
15 total sample size was 60. And 42 of those  
16 sites were lighting, and 18 of those were  
17 nonlighting.

18                   Now, you might note that the  
19 proportion of the sample design, the  
20 proportion of sites and lighting versus  
21 nonlighting is not the same as the proportion  
22 of sites that were in the population. That's  
23 because once we got to what we thought was a  
24 very credible sample size for lighting, we  
25 then pushed some of the sample size into the

1 nonlighting to increase some of our precision  
2 on those numbers.

3                   And so you can see that we  
4 actually were able to get better than 10  
5 percent on lighting in the design and then  
6 get something better than 30 percent on the  
7 nonlighting. And these are sort of the  
8 trade-offs you make when you go through the  
9 sample design process.

10                   So one of the things I liked  
11 about this study is it was a very data-driven  
12 study. And what I mean by that is we did a  
13 lot of metering and verification at the 60  
14 sites we visited. One of the things that we  
15 did, because peak demand estimates were so  
16 important to the study, we did long-term  
17 metering. We installed lighting loggers and  
18 elite loggers for what turned out to be  
19 roughly 12 months.

20                   On the slide, you can see  
21 where I flagged the winter peak -- on-peak  
22 period and the summer on-peak period to show  
23 that we -- we actually metered during those  
24 periods, which means we were able to get  
25 actual operating data from those windows of

1 time.

2 Elite loggers are -- sometimes  
3 I bring these loggers along as a show and  
4 tell. I didn't do it today. But elite  
5 loggers are -- they're true meter loggers.  
6 You know, you plug it in, and it actually  
7 tracks the power. The lighting loggers, on  
8 the other hand, simply track when the light  
9 goes on and off.

10 So, during the study, we used  
11 approximately -- or we metered approximately  
12 370 lighting data points. We used far more  
13 loggers than that, but that's how many data  
14 points we had, and 17 elite power logger  
15 points.

16 Any questions at all at this  
17 point? No?

18 (No response.)

19 MR. LEDYARD: So when we did  
20 the -- when we did our metering and  
21 verification, what we -- what we're trying to  
22 do is do what you call -- or what we call the  
23 metering and verification protocol Option A,  
24 which is where you take a combination of  
25 stipulated factors, which in this case are

1 wattages for lighting, which was the primary  
2 measure type, and then you measure the key  
3 factors like quantity and hours of use to  
4 calculate the savings. And they're done in  
5 fairly large spreadsheets, as you can  
6 imagine. They're relatively complex because  
7 they -- they take into effect interactive,  
8 they take into effect quantity changes and  
9 operating changes and percent on, that kind  
10 of thing.

11                   And as I said before, both the  
12 lighting and the nonlighting savings were  
13 analyzed to show the drivers of the final  
14 realization rate. And what I mean by that  
15 is, if there was adjustment to the track --  
16 if there was an adjustment to savings due to  
17 a documentation error that we found, or if  
18 there was an adjustment to savings due to the  
19 different technology that we found on site or  
20 of a different quantity of the technology on  
21 the site, we essentially bucketed the savings  
22 to accommodate for each change and -- and for  
23 each event that might have occurred. That  
24 would move the savings away from what was  
25 tracked.

1                   And the nonlighting measures  
2 primarily were door heater controls, vending  
3 machining controls and ECM fans, fan controls  
4 and motors.

5                   So this is where I have Ken on  
6 the phone. Ken oversaw the billing analysis  
7 work. And essentially what we did was a  
8 fixed-effects billing analysis. And the  
9 reason we did the billing analysis was  
10 because, at the very outset, actually, with  
11 Dick Oswald, there was a real interest in  
12 understanding whether or not a billing  
13 analysis could be performed on this group, on  
14 this type of program.

15                   A billing analysis can be  
16 cheaper when it works. A billing analysis  
17 can be relatively empirical, you know,  
18 because it's driven by consumption data which  
19 is tied to the revenue stream of the utility,  
20 which means it's usually pretty darn good.  
21 So these are all -- these are all good things  
22 to think about trying to do.

23                   So we've tried to do a  
24 billing -- or so -- so we did perform a  
25 billing analysis on these -- on the -- on the

1 program. And the fixed effects billing  
2 analysis essentially used participant  
3 pre/post consumption data. And then it, in  
4 fact, has another mechanism. Ken can  
5 explain, if you want the details, of how --  
6 of actually using the participants themselves  
7 as part -- to create a control group, sort of  
8 a proxy control group.

9           The billing analysis utilized  
10 participant consumption data from May of 2009  
11 through February of -- through February,  
12 March of 2013. And the thing to remember  
13 here is, essentially, when you do a billing  
14 analysis, you need a year -- since we're  
15 looking at the 2011 program year, you needed  
16 a year of pre, a full year of pre; so in  
17 other words, all of 2010. And you needed a  
18 full year of post in, essentially, 2012 and  
19 beyond.

20           Well, one thing that's  
21 critical, it's a threshold issue for a  
22 billing analysis that you get all the billing  
23 data for all the spaces that are treated in  
24 the program. And oftentimes, this is going  
25 to be done reliably in the residential sector

1 or some -- some sectors.

2 For small business we've had  
3 problems with it before, and so we tried --  
4 and so one of the things that -- that --  
5 well, I'll get into it more in a moment, but  
6 the billing analysis results were  
7 significantly lower than the M and V results.  
8 And one of the things we suppose is occurring  
9 is that we simply didn't have all the billing  
10 data that we wanted for the -- for the  
11 treated premises, for the treated buildings.  
12 And without that, it's simply not a -- it's  
13 not a good tool to estimate energy savings.

14 So these are the M and V  
15 analysis results, and it's a scatter plot.  
16 And on the -- on the Y axis you have our  
17 estimate of energy savings, and on the X axis  
18 you have the tracking estimate of energy  
19 savings. And I've color-coded the -- the  
20 lighting sites to be light blue, and I've  
21 color-coded the -- the nonlighting sites to  
22 be darker blue.

23 And the diagonal line, the  
24 line that goes directly up the diagonal --  
25 there are actually two lines there -- well,

1 one of them is directly up the diagonal --  
2 is, in fact, what the realization rate would  
3 be -- is the line that all the sites would  
4 fall on if the -- if our estimate of gross  
5 savings fell exactly on what your estimate of  
6 the tracking savings were.

7                   And so one of the things you  
8 see immediately is that -- well, there's a  
9 couple things. Well, one of them is that the  
10 lighting realization rate was almost dead on  
11 with 99 percent realization rate overall.  
12 And the nonlighting realization rate was off  
13 by roughly 20 percent or so.

14                   But one of the things you see,  
15 which is a little unusual, actually, is there  
16 were -- are very few outliers in here.  
17 Usually you see one or two that are just  
18 crazy one way or crazy in the other way, and  
19 that's done to have some, you know, profound  
20 effect on the final numbers, but in this case  
21 things actually behaved really well on the  
22 whole. So that's -- so I think that's good  
23 news.

24                   The overall program level  
25 realization rate is 96.2 percent. Again,

1 that's because the lighting is so much of the  
2 program savings that that lighting  
3 realization rate actually pulls everything  
4 up. It pulls up the nonlighting stuff.

5 MR. McDONNELL: So on the  
6 nonlighting stuff --

7 MS. DUVA: Pat, could you  
8 identify yourself and affiliation for the  
9 court reporter.

10 MR. McDONNELL: Oh, I'm sorry.  
11 I'm Pat McDonnell from UI.

12 For the nonlighting stuff, is  
13 there any -- I realize as you pick -- as you  
14 pick apart the data, you get a smaller and  
15 smaller sample, and I think that's  
16 problematic. But are there any trends that  
17 you can identify in the nonlighting measures  
18 that would make you say that these are  
19 more -- these deviated from the reporting  
20 savings more than others?

21 MR. LEDYARD: Yeah. And I'll  
22 get to that, actually. That's a good point  
23 because that's one of the key -- that's one  
24 of the key findings I wanted to talk about.  
25 And I mean, I'll give you the short. I'll

1 save you some of the trauma.

2 MR. McDONNELL: You can  
3 explain it.

4 MR. LEDYARD: So one of the  
5 things we found -- one of the big drivers  
6 that was at -- I believe it was 10 or  
7 11 percent of the negative change was due to  
8 what -- what we're calling "documentation  
9 errors." You know, in other words things  
10 where it looked like it could have been  
11 calculated more closely to what the PSD was  
12 having it and try and be calculated for.

13 And what that means is that --  
14 and I talked actually to the engineer that  
15 did all this, the nonlighting work, yesterday  
16 about this. And essentially, what -- what  
17 he's saying is that there -- actually, it was  
18 followed as closely as you could, but a lot  
19 of times there were other extraneous factors  
20 that could have been used in making those  
21 savings estimates better, that were still in  
22 a PSD formula itself.

23 So -- so one of the things  
24 you'll see is that I make a recommendation  
25 that we, sort of, you know, maybe keep a

1 closer eye on the nonlighting PSD,  
2 consistent -- you know, applying PSD  
3 consistently to the nonlighting measures, but  
4 I'm actually not suggesting a change to the  
5 PSD form because those -- those formulas  
6 actually look pretty darn good to us.

7 MR. McDONNELL: Okay.

8 MR. LEDYARD: Yeah. It's a  
9 great question. Thank you.

10 So this is the M and V  
11 analysis result. And so what you have here,  
12 it's a little confusing at first, but let me  
13 see if I can clear -- let me see if I can  
14 clear up things. You have -- you have the  
15 overall -- so you have the overall sample  
16 size was 60, as we discussed. You have all  
17 the different changes that could have  
18 occurred between the -- between the point  
19 where the savings estimate was estimated in  
20 the tracking system and where you get to a  
21 gross realization rate at the bottom.

22 And then you have the kWh  
23 changes, the actual absolute kWh savings  
24 changes that occurs from one jump to the  
25 next. And then I have four columns. And

1 there -- and one -- the first one is simply  
2 the incremental ratio, or the change from  
3 the -- the estimate on that line to the  
4 estimate before that line. So it's simply  
5 the relationship between the current -- you  
6 know, the documentation adjustment, and the  
7 tracking adjustment is the adjustment -- is  
8 the incremental ratio adjustment factor.

9           Then the next two columns are  
10 the cumulative one, which simply shows you  
11 the change in overall realization rate that  
12 occurs when you use the tracking system  
13 estimate as the -- as the -- the point of  
14 comparison.

15           And the only reason I do that  
16 is because some people like to think of it  
17 one way and some people like to think of it  
18 the other way, so -- including me.

19           So anyways -- so what you see  
20 here is that, overall, you don't see a lot of  
21 big changes from, you know -- as I said  
22 before, the final realization rate is  
23 96.2 percent. In the final report, I  
24 actually provide this exact same table for  
25 lighting and for nonlighting. So you can see

1 the changes from lighting and nonlighting  
2 separately.

3                   And one of the biggest  
4 changes -- one of the biggest changes that we  
5 noted was in the HVAC interactive adjustment.  
6 And this is one thing that's kind of a funny  
7 thing -- well, it's not funny, but it's -- in  
8 Connecticut, the program savings document  
9 takes savings -- takes interactive savings  
10 for lighting, and that's a bit unusual,  
11 honestly. I don't -- in fact, I don't  
12 know -- I don't know of any other technical  
13 reference documents or any of the other ones  
14 that do that. I haven't seen it. So it's  
15 actually very unique.

16                   And one of the things it did  
17 in this study was -- so whereas for a lot of  
18 other studies the interactive actually  
19 becomes a credit that's added on, it's almost  
20 like a little, you know, boost to the savings  
21 because they don't track it. In your case it  
22 actually became a little bit of a -- there  
23 was a negative adjustment to that. And the  
24 reason why is because -- the biggest reason  
25 why -- well, there's a couple reasons why.

1 And I'll go into them in a moment.

2 But there -- the two biggest  
3 ones were sometimes you were taking  
4 interactive savings for installs that weren't  
5 necessarily in a cooled space, in a  
6 mechanically cooled space. And the other one  
7 is that the COP assumption in the 2011 PSD  
8 was different than what we found on site. It  
9 was actually a poorer -- or less efficient  
10 cooling unit installed in the PSD than what  
11 we found on the site.

12 Oh, and there's my -- the  
13 pluses and minuses of the things that move it  
14 up and down.

15 MR. BROWN: Those are red and  
16 green, by the way.

17 MR. LEDYARD: Yeah.

18 And so here's the summer peak  
19 demand savings results. And what I have  
20 here, instead of showing you the incremental  
21 and the cumulative changes in realization  
22 rate, I'm showing you summer on peak and  
23 summer seasonal.

24 In Connecticut -- and I don't  
25 know where Connecticut stands right now. I

1 don't know where CL&P and UI stand, but --

2 MR. EMBREE: We currently are  
3 doing seasonal.

4 MR. LEDYARD: You're doing  
5 seasonal still or no?

6 MR. EMBREE: Yes.

7 MR. LEDYARD: Yeah? Okay.

8 I was asked to both of them  
9 and so -- and we did. And for those of you  
10 who -- so the on peak is essentially a set  
11 period of windows from June through August,  
12 you know, weekday, one to five summer, five  
13 to seven winter and with the winter being  
14 December, January, I think. And it's the  
15 performance during those hours, the average  
16 performance during those hours.

17 The summer seasonal and the  
18 winter seasonal actually is more defined by  
19 when -- when -- it's when consumption  
20 actually exceeds a certain threshold that's  
21 been estimated by ISO.

22 And so what we found -- and  
23 this has been pretty steady for a lot of the  
24 evaluations I've done, is that summer  
25 seasonal actually tends to be a little

1 better. It tends to be a little bit higher  
2 number. For lighting, you don't see it as  
3 much as you do for air conditioning and other  
4 things that are truly weather dependent, but  
5 nonetheless, you still see lighting as coming  
6 up as a -- with a higher adjustment factor.

7 MR. McDONNELL: So back to the  
8 HVAC interactive adjustment again.

9 So is your recommendation  
10 going to be that we fix that in the PSD or we  
11 just take it out?

12 MR. LEDYARD: Yeah. So here's  
13 the thing -- so here's -- and I'll get to  
14 this in a moment, too.

15 So what we -- so in the report  
16 I recommended that you adjust it, right, and  
17 then, in a comment to the report, I was told  
18 that in 2013 you did adjust it. So it was  
19 one of those things where I think your  
20 natural program improvement process simply  
21 made an adjustment.

22 MR. McDONNELL: Just a little  
23 background. We put it in because a previous  
24 evaluation said, well, you're missing this  
25 and you're not compensating.

1 MR. LEDYARD: Yeah.

2 MR. McDONNELL: I'd be happy  
3 to take it out, I mean.

4 MR. LEDYARD: No. No. No. I  
5 wouldn't take it out at all. In fact, I kind  
6 of like it, you know. And really -- and I  
7 think it should be more of an industry  
8 standard, you know, because it's recognized  
9 as being a real credit and being a real  
10 impact, so...

11 So one of the things you'll  
12 see here is the operational adjustment, and  
13 that, like I just said, that's essentially  
14 the amount of -- that's, in my mind anyway,  
15 it's -- it's the consumption or it's the --  
16 it's the percent on during these -- the  
17 summer on peak and the summer seasonal  
18 windows.

19 And what you'll see is that  
20 there was an adjustment, a downward  
21 adjustment, and it's the most significant one  
22 of all of them, on operational adjustment.  
23 And operational simply means that it's the  
24 difference between what -- what's estimated  
25 in the PSD versus what we found in the

1 operation of the various measures, and that's  
2 the biggest change.

3 One of the things that I did  
4 in the report -- and for those of you at home  
5 I'm on Slide 14. I -- we took the coincident  
6 factors from our evaluation, and we took the  
7 coincident factors from the PSD by -- by  
8 building type. And this is where I was  
9 talking about where the building types were  
10 for the -- for the lighting measures in  
11 particular.

12 And although the operating  
13 adjustment was the primary driver of lower  
14 peak demand savings, when I looked at the --  
15 sort of the PSD facility ones -- because you  
16 don't use overall one. You apply them to  
17 vary -- to facilities depending on what type  
18 is participating. When you -- when I looked  
19 at it by facility type, it actually didn't  
20 suggest any changes at all. It was one of  
21 these things where the -- all of your  
22 estimates and our estimates all were  
23 statistically the same.

24 So one of the things you'll  
25 see is that, although that -- that adjustment

1 is the biggest adjustment to the peak savings  
2 estimate, I'm not actually making a  
3 recommendation to the PSD because there was  
4 nothing that fell significantly different  
5 than what's currently being assumed.

6 Geoff?

7 MR. EMBREE: And we just note  
8 that that kind of research can be very  
9 expensive to do. So it's good value to just,  
10 kind of, have that added check as part of the  
11 study.

12 MR. LEDYARD: Right. Yeah.  
13 Your point being that, hey, if we were going  
14 to try and go down this road, it would get  
15 expensive.

16 MR. EMBREE: Yeah.

17 MR. LEDYARD: Yeah.

18 MR. EMBREE: So you might as  
19 well get it for free --

20 MR. LEDYARD: Yeah.

21 MR. EMBREE: -- while you were  
22 out there anyway.

23 MR. McDONNELL: So just -- I  
24 realize you're not recommending a change, but  
25 just out of curiosity, what were -- what kind

1 of things drove the lower coincidence factors  
2 in the retail and the restaurant?

3 MR. LEDYARD: You know, I  
4 don't know. I don't know.

5 One of the things I didn't do  
6 in the report, and I -- and I should have in  
7 hindsight. Because a lot of times  
8 I'll present -- I'll show actually the load  
9 shape. I'll show actually the percent on --  
10 as a profile so you can see -- and even  
11 show -- show the overall, show the retail,  
12 show the, you know -- and so that you can see  
13 that.

14 MR. McDONNELL: Right.

15 MR. LEDYARD: And we didn't do  
16 it in this. And I could actually do it just  
17 on the side because it's, you know, it's  
18 fairly -- it's simply new.

19 MR. McDONNELL: I always  
20 thought that, you know -- I'm pleased to see  
21 the office was actually better than what we  
22 claim. Because I always thought offices, you  
23 know, people go on vacation in the summer and  
24 they turn -- they leave their lights off,  
25 because they're not there.

1 MR. LEDYARD: Right. Yeah.

2 MR. McDONNELL: So I'm  
3 wondering, you know, are we taking that into  
4 account?

5 And then retail and  
6 restaurant, you take that, you know, they're  
7 open. They're open, kind of thing, or  
8 they're not.

9 MR. LEDYARD: Yeah. Yeah.

10 MR. McDONNELL: It's mostly  
11 lighting.

12 But I'm curious. If you can  
13 tease that out --

14 MR. LEDYARD: Yeah. I mean,  
15 our numbers are pretty close -- you know --

16 MR. McDONNELL: Well 68  
17 versus --

18 MR. LEDYARD: Well, yeah --  
19 no. Yeah. Retail is off, isn't it? Yeah.

20 MR. McDONNELL: A restaurant,  
21 and retail would be even more.

22 MR. LEDYARD: Yeah, yeah.

23 MR. BROWN: So where  
24 would the -- the municipal and government  
25 facilities in here are -- they could be

1 within the office sector or they could be  
2 within the others?

3 MR. LEDYARD: Yeah. I --

4 MR. BROWN: So in those 19  
5 projects?

6 MR. LEDYARD: Yeah. I think  
7 they're in an office in this one, I believe.  
8 I can confirm that if you want.

9 MR. BROWN: Well, I just kind  
10 of --

11 MR. LEDYARD: I also don't  
12 know how many are actually in here. You  
13 know, I don't -- is there a municipal  
14 initiative?

15 MR. HALLER: This is Roy from  
16 UI. So the -- for small business in UI's  
17 service territory, you would not have any  
18 municipality facilities in that -- in that  
19 mix.

20 MR. EMBREE: Yeah. I'm  
21 thinking about the City of Middletown and  
22 EO -- it was all pretty much the EO  
23 evaluation, I think, whereas by community, it  
24 probably wouldn't have fit in that small  
25 business.

1 MR. LEDYARD: So I think there  
2 might be other programs that target those  
3 more explicitly, or maybe their assumption  
4 exceeds what's --

5 MR. BROWN: Yeah. Well, this  
6 is Eric at CBIA. So this is helpful because,  
7 I guess, maybe, because I'm in this building,  
8 I have this two-by-two diagram in my head.  
9 And one of them was sort of with respect to  
10 utilization. And this may be outside of the  
11 scope, or maybe it's coming later, but I'll  
12 tee it up now since we kind of started to get  
13 into it, was -- was, you know, sort of the  
14 private sector C and I versus municipal and  
15 government. And it sounds -- looks like this  
16 is pretty highly -- high percentages of  
17 private sector commercial/industrial.

18 And then the other, sort of,  
19 split I'm wondering about, if I understand  
20 this program correctly, it's both low or  
21 no-interest financing but also some incentive  
22 options or rebate options as well.

23 And so just in terms of  
24 utilization, again, this may be out of the  
25 scope of what you did, but what sort of the

1 breakdown is between those who use the  
2 financing versus those that --

3 MR. LEDYARD: Right.

4 MR. BROWN: -- or maybe it was  
5 a combination. I'm not sure, but that's --

6 MR. LEDYARD: Yeah. So that  
7 was not in the study, but I can tell you  
8 this, that there is a subsequent study that  
9 Tom Franks and Lori are actually deeply  
10 involved in, who are looking at financing  
11 explicitly because it's such a -- well, it  
12 can be a program driver or barrier, right,  
13 and I want to make sure we're on the right  
14 side of the issue. And to begin that, you  
15 need to understand it. So there is quite a  
16 bit of focus coming up on that, in fact, a  
17 study directed exactly at that issue. Good  
18 point.

19 So this is my busiest slide.  
20 And I'll apologize in advance. But it  
21 actually is fairly straightforward, and in  
22 the report it's much more detailed, so I'm  
23 not going to spend a lot of time here on it.  
24 But what we did do, I mentioned the PSD, the  
25 Program Saving Document review, and

1 essentially looked at the PSD formulas. We  
2 looked at the PSD inputs, and we tried to  
3 figure out -- or tried -- not tried -- we  
4 tried to, one, just make sure the formulas  
5 are correct, you know, in -- in stark terms,  
6 that they make -- that they're sort of  
7 conformed to industry standards, and then, to  
8 also see if there's any other conclusions or  
9 thoughts we might have on how they can be  
10 improved.

11 And again, this is detailed  
12 more in the report. And really the only  
13 thing that came up is the COP issue, which  
14 Pat mentioned before. And you'll see that in  
15 the recommendation coming up momentarily.  
16 And, you know, like I said before, we -- we  
17 made a recommendation that it be adjusted to  
18 reflect what we found on site, but in fact,  
19 the utilities have beat us to the gun, you  
20 know, beat us -- beat us to the -- to the  
21 punch.

22 So as I mentioned before, the  
23 second meter -- the second impact approach  
24 we -- we used in this study was a billing  
25 analysis. And these are the billing analysis

1 results. And one of the things you'll see is  
2 the realization rate is much lower. I mean,  
3 on the other one we had virtually 96 percent.  
4 In here, we're coming up with a third of  
5 that.

6                   And we explored different  
7 billing analysis approaches. We explored the  
8 use of different billing analysis data  
9 because one thing you can do is you can  
10 become more and more stringent about the type  
11 of data you use in the analysis. You start  
12 off with all billing data, and then maybe you  
13 limit it to people where you definitely have  
14 a year pre or post, and you limit it to  
15 people that -- that didn't -- then you limit  
16 it to accounts that didn't have changes in  
17 account numbers.

18                   You know, you start limiting  
19 it more and more to people that you think are  
20 more and more representative of -- or more  
21 and more capable of showing program savings  
22 through their consumption data. And even  
23 when we applied those more stringent data  
24 requirements, the billing analysis number  
25 didn't budge. It stayed at 34 percent.

1                   And so one of the things  
2   that -- that we finally concluded is that --  
3   and I'll talk about this in a moment too --  
4   is that the small business program just might  
5   not be a good candidate for a billing  
6   analysis. The overriding concern being  
7   simply that if you don't have all the billing  
8   data, you're not going to come up with all  
9   the savings.

10                   So if you have a site that  
11   happens to have two -- two meters or two  
12   accounts and each -- and -- and that entire  
13   site was treated, and you only get one  
14   account, then your savings, you know, in --  
15   in gross terms are halved because you don't  
16   see the other half. And that sort of  
17   phenomenon can really sell the billing  
18   analysis.

19                   So in a moment you'll see that  
20   I recommend that we -- that -- and what the  
21   report does, in fact, is push forward the M  
22   and V results as being the -- the formal  
23   final estimate of savings and that the SBEA  
24   program undertake a billing -- you know,  
25   that the -- that the billing analysis is

1 desired for the future, that some process  
2 will be put in place to make sure that we're  
3 getting all the meters, all the accounts,  
4 every time we touch one of these  
5 participants.

6                   And this just summarizes what  
7 I was just talking about. One of the things  
8 I will point out -- and Ken has been on the  
9 frontline of this issue with me across the  
10 region. You know, I've had three or four  
11 clients. I do a lot of small business study  
12 work. And I've had three or four clients in  
13 the Northeast -- well, in New England, where  
14 we've had very a similar impact, where we've  
15 done a bottom-up M and V approach, and we do  
16 a top-down billing analysis approach.

17                   And -- and the results are  
18 surprisingly the same as what we found here  
19 in Connecticut. And it happened in New York  
20 and Massachusetts, specifically, very  
21 recently, like during the same evaluation  
22 window. And our conclusion is largely the  
23 same across the board, that we just are not  
24 convinced we had all the billing data to do  
25 those -- to do it -- to do it correctly.

1 MR. EMBREE: Is that impacted,  
2 maybe, by the fact that on the bottom-up  
3 analysis you did a lot of metering, you're  
4 looking at a lot of lighting, so you have a  
5 fair amount of confidence in those results?

6 MR. LEDYARD: Yeah. That's  
7 right. And I'll touch on -- and that's  
8 exactly right. So one of the things Mike  
9 asked me --

10 MS. THOMPSON: I couldn't hear  
11 the question or comment. Could you repeat  
12 it -- repeat it please, Tom?

13 MR. LEDYARD: Sure. Well, go  
14 ahead Geoff.

15 MR. EMBREE: Yeah. That --  
16 that was Geoff. I was saying that maybe the  
17 reason that he's able to make such a strong  
18 conclusion about favoring the bottoms-up  
19 approach over the billing analysis, is that  
20 we have a lot of very solid metering data.  
21 We were examining the lighting measures, and  
22 there was not a ton of variation.

23 So, ordinarily, if you have  
24 two different approaches, you would -- you  
25 would, kind of, try to weigh both of them,

1 but you're saying that you have a lot of  
2 confidence.

3 MR. LEDYARD: Yeah. That's  
4 exactly right. And so -- and -- and, you  
5 know, I appreciate your comment.

6 One of the reason -- and this  
7 is reason one, essentially, for relying on  
8 the M and V results, Geoff, is because, you  
9 know, historically, we do rely -- for small  
10 business programs of this nature we rely on M  
11 and V, and the -- and the reason is fairly  
12 straightforward. I mean, often there's an  
13 audit in advance that tells you what was  
14 there and the quantity. Often we go out to a  
15 sample and we verify what was installed, and  
16 then we do metering on all the operation of  
17 them, you know. So it's very empirical, and  
18 it's very hands on, and it's very eyes on.

19 And in my mind, it naturally  
20 feels more rigorous for programs of this  
21 type, where you know the pre, you know the  
22 post, and you're -- and you're measuring  
23 the -- now billing analysis has their own  
24 advantages and disadvantages also. But in  
25 this case, I think it was pretty clear that

1 the M and V results are firm.

2 Now, the one thing that I  
3 would point out about the M and V results is  
4 that, you know, recruitment it's -- it --  
5 recruitment is important, right. If -- if  
6 what you have is M and V results of only the  
7 people that you could get ahold of and go out  
8 and visit, well, that's an M and V result  
9 with some kind of bias to it.

10 So one of the things we try to  
11 do, and we did a good job adhering to this  
12 actually in the report is, you know, make  
13 sure that when we call people we're trying to  
14 get out to those people. And we're not --  
15 and if they're not there or whatever, they're  
16 out of business, we're not just dropping  
17 them. We're trying to keep track of them,  
18 because that's one thing that can have a  
19 profound effect on the M and V side, is -- is  
20 incorrect recruitment and introducing bias in  
21 the results there.

22 And in a lot of ways that  
23 might be one of the softer -- one of the soft  
24 points in the M and V approach actually. And  
25 it often goes undiscussed in reports, but

1 it's important. So --

2 Yes, Les?

3 MR. TUMIDAJ: Yeah, Les  
4 Tumidaj.

5 In -- maybe not in this study,  
6 of course, but in some the other work you  
7 just mentioned, have you folks been able to  
8 dig a little bit deeper and diagnose what's  
9 going on? I mean, the implication, you're  
10 missing two-thirds of the meters, for  
11 example, in these other studies, or what does  
12 this really mean?

13 MR. LEDYARD: Yeah.

14 MR. TUMIDAJ: Inadequate data?

15 And separately have you guys  
16 ever looked at just a subset of buildings  
17 just -- just for the fun of it? We have  
18 unambiguous metering, and to see what -- that  
19 you have, what kind of correlation we had  
20 between the M and V results and actually the  
21 performance. So the latter, ultimately --  
22 it's kind of what matters, you know, overall  
23 to society.

24 So I'm kind of curious.

25 MR. LEDYARD: A great -- great

1 point. Okay. So I have two things.

2 So in a study I did in New  
3 York, in upstate New York, we had the -- we  
4 did long-term metering also. And one of the  
5 things that happened in that study was we did  
6 the billing analysis earlier in the  
7 evaluation site, you know.

8 MR. TUMIDAJ: Uh-huh.

9 MR. LEDYARD: So we started  
10 metering and then we did the billing  
11 analysis. We realized, oh, the billing  
12 analysis isn't right -- or not that it's not  
13 right, but it's coming -- Ken is going to  
14 scream at me here in a minute -- but -- but  
15 the billing analysis was coming back with  
16 divergent results from what we were finding  
17 on site.

18 So the issue becomes, is it --  
19 is it this metering issue? So when we we're  
20 going back out to sites, we actually gathered  
21 more and more meter data. We gathered -- we  
22 actually scoured the site for additional  
23 accounts and meters, and then we did an  
24 analysis of that subset. And in that subset,  
25 Les, was -- it might have been 15 sites. I

1 mean, it wasn't a lot, but it did improve the  
2 realization rate significantly. So that's  
3 one thing that we did on the billing analysis  
4 side.

5 MR. TUMIDAJ: I'm sorry. How  
6 significant? I'm just kind of curious.

7 MR. LEDYARD: No, it went up  
8 to 70 percent, 80 percent, somewhere in  
9 there. I mean, it made a big jump, you know.  
10 But again, it was a small sample size, and it  
11 wasn't -- it wasn't designed from the outset  
12 to be that way --

13 MR. TUMIDAJ: Right.

14 MR. LEDYARD: -- but it was  
15 something that we did to try and understand  
16 what was happening and whether or not it  
17 could have that kind of effect.

18 MR. TUMIDAJ: All right.

19 MR. LEDYARD: And then the  
20 other thing I can say is that, in -- in New  
21 York, I'm actually doing a lighting control  
22 study in the small business sector right now.  
23 We're doing premetering and postmetering for  
24 occupancy sensors. And one of things we're  
25 doing as part of that process is checking for

1 meters at all 70 of those sites that we're  
2 going to. And we're doing it more -- what's  
3 the word -- more diligently, you know, more  
4 comprehensively this time so we can really  
5 get a better handle on whether or not this  
6 issue is at play or not.

7 MR. TUMIDAJ: All right.

8 MR. LEDYARD: Yeah.

9 MR. TUMIDAJ: I'd be really  
10 interested in seeing that.

11 MR. LEDYARD: Oh, yeah.

12 MS. LEWIS: This is Lori  
13 Lewis.

14 When Tom -- in fact, Ken can  
15 contribute. We've had these discussions. So  
16 we talked about the sensitivity of, you know,  
17 is it 12 months pre/post, or isn't it, and  
18 who do you take out, by what criteria. What  
19 Ken found was a great stability, I mean, a  
20 really solid stability in that realization  
21 rate, which indicates it's not sensitive to  
22 the variants or some of the reasons why you  
23 would take out these different groups. And  
24 you tend do that in most billing analysis  
25 to -- as a validity check.

1                   Then we've got these much  
2 lower realization rates. We have a very  
3 stable billing analysis, and the realization  
4 rate is lower, which matches the hypothesis  
5 that we're -- we're missing meters, as Tom  
6 explained. If you're missing meters that  
7 have any savings associated with them, you're  
8 going to show a lower realization rate. I  
9 mean, that's by the math, simple math.

10                   So it's not absolute proof  
11 that's what's going on, but all the evidence  
12 points that that hypothesis is correct. And  
13 sometimes people are able to get billing  
14 analysis results for small commercial more  
15 than they are other C and I. And there  
16 are -- states recommend that, once in a  
17 while, you pilot, you test. You get the same  
18 answers in both; it's extremely strong.

19                   But, in general, across all  
20 evaluations of these programs, in general,  
21 the accepted methodology for C and I is using  
22 methods in IPMV, International Protocol of  
23 Measurements and Valuations, and to ensure  
24 that there's metering or measurements of the  
25 most uncertain factor, which was done here.

1 So I kind of see it as the pilot test. And  
2 everything matches the fact that we have a  
3 problem with having all the meters associated  
4 with the savings.

5 MR. TUMIDAJ: That's a great  
6 response. I very much appreciate that, but  
7 it also poses a challenge. At some point,  
8 this industry, our industry, has to bridge  
9 that gap because we have to really understand  
10 billing performance, at some point, for this  
11 stuff to ultimately makes sense.

12 I very much trust what we're  
13 getting in the M and V, as far as the savings  
14 are concerned. And I'm disturbed that we're  
15 off by two-thirds. That's a lot of meters  
16 that have been missed. There's something  
17 going on there that we need to get a handle  
18 on eventually, sooner rather than later, as  
19 an industry and as a program as well;  
20 otherwise, I'm not sure if we can really  
21 speak with confidence, in the broader  
22 societal basis, what we're accomplishing.

23 MR. McDONNELL: And when --  
24 when you do it -- I'm sorry. Pat McDonnell  
25 from UI. When you do a billing analysis, how

1 would you identify or account for a change in  
2 the business operations, because the economy  
3 was kind of soft in -- in the years before  
4 the evaluation period. It has gotten better.

5 So you might have a small  
6 manufacturer that had maybe one shift, went  
7 to two shifts, or had, you know, more  
8 machinery operating more frequently. How do  
9 you deal with that?

10 MR. LEDYARD: Ken, can you  
11 bail me out on this one?

12 MR. AGNEW: Yes. Ken Agnew  
13 from DNV GL. Excuse me. I think that's a  
14 great question, and that actually is  
15 another -- that that's another aspect of the  
16 challenge of billing analysis.

17 I like the fact that you have  
18 this great empirical data that's connected to  
19 the revenue system, et cetera, and -- and  
20 then you have to figure out how -- how well  
21 can we get to the numbers we want, from an  
22 evaluation perspective, with those data. All  
23 we can do is some sort of pre/post delta.  
24 And what we really want is the program change  
25 that -- that is affecting that pre/post

1 change, but there's always nonprogram change  
2 happening as well. There's just general  
3 economic stuff, even -- even more general  
4 than you're talking about. Just, you know,  
5 a -- in normal year without a recession, and  
6 so forth, there may be just a general  
7 increase because you -- you've got a  
8 low-level increase in activity as time goes  
9 on.

10 Over the last five years, that  
11 increase could be quite a bit more dramatic,  
12 potentially, and there are various ways  
13 that -- that we try to correct for that. On  
14 the residential side, it's a little easier to  
15 come up with actual comparison groups of  
16 households that you -- you believe are  
17 representative of the general trend that's  
18 going on in the -- in the marketplace.  
19 That's much harder with commercial buildings.

20 And you're absolutely correct  
21 that -- that, if there is -- underlying all  
22 this, if there is a correlation, if -- if  
23 buildings are more likely to come in and do a  
24 program like this on a ramp-up kind of trend,  
25 you know. So if they're more likely to come

1 in and do a program like this when occupancy  
2 is relatively low, and in the -- in the  
3 postprogram period occupancy is higher, or as  
4 you said, if they're -- because they are able  
5 to bring in another shift, those kinds of  
6 things, we can't account for those. We don't  
7 have that information.

8                   And that -- that's one more,  
9 and there are a number of places where we --  
10 we can't -- we can't confidently know whether  
11 we can address those things. And that --  
12 that ultimate lack of confidence is -- is why  
13 the results from the on-sites -- the on-site  
14 approach, ultimately, for all of these  
15 evaluations that we did out East really  
16 became the primary results.

17                   MR. LEDYARD: Ken, what about  
18 the notion of the participants as, you know,  
19 using participants as a control group or  
20 using -- you know, somehow incorporating a  
21 control group in the analysis to account for  
22 that.

23                   MR. AGNEW: Well -- so in --  
24 in the methodology that we used for this,  
25 there is no -- there -- there are no other --

1 there's no explicit control group or  
2 comparison group. There are -- I want to  
3 avoid going too far into the weeds here. The  
4 approach that we used here, it's a quite  
5 common approach.

6                   If the -- in its simple terms,  
7 you are trying to account for general trends  
8 that are happening across the population, the  
9 models -- if -- if for, in any given month,  
10 for the -- there may be 10 percent of the  
11 sites are -- are changing from pre to post,  
12 are -- are taking part in the program, but  
13 the other 80 or 90 percent are not. They are  
14 still only in the pre period or they're only  
15 in the post period. So the model allows  
16 those other sites to inform what kind of  
17 trend is going on underlying outside of the  
18 program.

19                   So it's a -- it's a model  
20 approach to dealing, to try to address that  
21 nonprogram change that might be going on  
22 between the pre and the post period. So I  
23 won't go any -- I can go deeper into that if  
24 you want, but that's the approach that we  
25 used here. It's quite common.

1                   The other way to try to  
2 address that issue is to pull in some sort of  
3 comparison group. You can pull in program  
4 participants for this program that, for  
5 instance, participated in 2010 or 2009. We  
6 know that they are all in the post period of  
7 their program participation, so we know that  
8 they're not going to be putting in a big, you  
9 know, set of new lights because they did it  
10 two years ago or two years previous. And so  
11 we can use them as, sort of, the steady-state  
12 nonprogram evidence of change.

13                   And we do that on the -- on  
14 the residential side, not very commonly here,  
15 because frequently these programs are -- are  
16 not particularly stable over time and -- and  
17 it's not clear that that kind of a comparison  
18 group is -- is all that effective. You can  
19 even go more general. You could just try to  
20 pull in an altogether different sample of  
21 commercial buildings as your comparison  
22 group, but once again, there's quite a bit of  
23 variability in the populations out there.  
24 And -- and getting a good match is always a  
25 concern with a comparison group.

1                   You can cause just as much  
2 trouble by getting a comparison group that  
3 doesn't match very well as by, you know, as  
4 by not having a comparison group.

5                   So the approach that we used  
6 here is actually one that is recommended in  
7 the universal methods protocol, which -- with  
8 Mimi Goldberg here at DNV GL and I actually  
9 put together. It -- it's one of our primary  
10 recommended approaches precisely because it  
11 does address a lot of the pre/post nonprogram  
12 change, and it doesn't bring in the concerns  
13 related to a mismatched comparison group.

14                   So I'll stop there before I  
15 get too far in the weeds. I can go deeper if  
16 people want it, but I'll stop there.

17                   MR. LEDYARD: I think that's  
18 deep enough.

19                   MS. LEWIS: I think -- this is  
20 Lori. I absolutely agree with Ken. It was  
21 nice that I got to work with him and sort  
22 of -- some of these things we could probably  
23 debate for a long time, the little minutia  
24 but, on the most part, quite agree in terms  
25 of what was done and how far to take it.

1 I mean, the stability is one  
2 thing, but there's -- there's definitely  
3 economic theory that, given the time period  
4 we've got, we could underestimate the  
5 realization rate due to coming out of  
6 recession. But most of the billing analysis  
7 in those residentials that have tried to use  
8 aggregate economic variables over time have  
9 not found that effect. A few have, but  
10 it's -- it's not universal. And the biggest  
11 thing that swamps all of those concerns is  
12 whether you have all the meters -- so the  
13 fact -- not to spend a lot more on this data,  
14 bringing other variables or doing that. And  
15 I've seen and been involved where you do  
16 subsets with surveys, in terms of occupancy  
17 of floors, and I've also been involved where  
18 we did on-sites and more like IPMVP Option C,  
19 sort of individual billing analysis for large  
20 C and I. And that tended to work where you  
21 had a lot of detail, but it still did not  
22 prove itself to be more convincing or  
23 cost-effective than the M and V when you went  
24 to that degree.

25 MR. LEDYARD: So slide 20 --

1 well, thank you for the -- thank you, Ken.

2 Thank you, Lori.

3 Pat, is that okay?

4 MR. McDONNELL: Perfect.

5 Thanks.

6 MR. LEDYARD: Yeah. So I'm

7 down to conclusions and recommendations.

8 Essentially, this is a summary slide of some  
9 of the savings results I've presented to you  
10 earlier. I've highlighted -- or I guess I've  
11 placed arrows next to the big results that I  
12 think we should take away.

13 Well, conclusion one is fairly  
14 simple. The program is doing a lot of, you  
15 know, it's generating a lot of energy savings  
16 as far as we can tell, based on the M and V  
17 results, and that's good news.

18 The second conclusion I have  
19 is that, hey, the -- the program savings  
20 document is producing reasonable estimates of  
21 impacts. When you see a realization rate of  
22 96.2 percent, and even 90 percent for summer  
23 seasonal, those are -- those are relatively  
24 good numbers.

25 One of the things that the

1 SBEA program benefits from is multiple  
2 previous evaluations, you know, sort of an  
3 evaluation is done or recommendations made,  
4 the PSD improves, and then the savings get  
5 better. And then, here we come along, you  
6 know, two or three evaluation cycles later,  
7 and the PSD is doing a decent job. So I  
8 think -- in some ways, I think this is  
9 evidence of a system that can work pretty  
10 well.

11 Conclusion three we've  
12 discussed. I don't believe the SBEA is a  
13 good candidate for program level billing  
14 analysis simply due to the uncertainty around  
15 the relationship between accounts and trading  
16 spaces.

17 I understand Les' point, which  
18 is simply, hey, if at some point, as a group,  
19 we can't get -- we can't find savings in the  
20 actual bills, you know -- you know, it sort  
21 of softens our stance on what this is  
22 actually accomplishing. I mean, it  
23 doesn't -- I don't think it undermines it  
24 entirely, but look, it would be nice to  
25 certainly see it, right.

1                   So to the extent that it is  
2     desired, Les, and -- and in Connecticut, that  
3     there may be -- be a better system employed  
4     to make sure that all those billing meters,  
5     accounts, are all being gathered  
6     systematically.

7                   The RFP didn't -- we  
8     calculated winter and connected demand  
9     savings numbers simply because, you know, we  
10    could. I mean, we had all the data. We had  
11    everything we needed. And so we -- and so we  
12    did all that.

13                  And one of the things that  
14    popped out was that the -- some of those --  
15    and Pat, this goes to the tracking systems a  
16    little bit. We found that the -- some of  
17    those numbers are -- well, some of them were  
18    zeroed. You know, for some reason, some of  
19    the winter savings were zero, and some of the  
20    demand savings were just off quite a bit in  
21    the tracking systems. And I was wondering if  
22    it was almost because there's so much focus  
23    on some of the other things, that maybe these  
24    two savings estimates that are tracked are  
25    not tracked as rigorously as the other ones.

1                   And so one of the things I  
2     recommend is that -- that for those two  
3     elements, the winter and the connected demand  
4     on the sponsors, just keep a closer eye on  
5     how the PSD is asking them to calculate  
6     savings.

7                   MR. EMBREE: Yeah. I would  
8     say that connecting kWh is maybe not as much  
9     a concern because we've got the summer and  
10    winter. In the past, winter was less of a  
11    concern, but it's becoming increasingly  
12    important, as you know, with the gas pipeline  
13    constraints and all that.

14                  MR. LEDYARD: Yeah.

15                  MR. EMBREE: So I -- I  
16    would -- I would think that, presently, we're  
17    doing a much better job on winter.

18                  MR. LEDYARD: Well, that's the  
19    other thing, Goeff, and it's something that  
20    should always be remembered. I looked at the  
21    2011 program year. I mean, there's been two,  
22    two and a half years of activity since then  
23    in your tracking systems, you know. So some  
24    of this might be clearer now than it was, you  
25    know, two and a half years ago.

1                   And then here's the -- the  
2                   conclusion about the COP. You know, we -- we  
3                   recommended that -- that simply just making  
4                   sure that when an interactive is applied that  
5                   it's done in mechanically cooled spaces, and  
6                   for lighting, installed in mechanically  
7                   cooled space, and that this COP assumption be  
8                   updated. And then, I know in the footnote  
9                   that, in fact, it has been updated, so this  
10                  recommendation has been taken care of by the  
11                  utilities.

12                  MR. EMBREE: The reason we use  
13                  that 3.5 instead of the 2.9, which might be  
14                  more appropriate for small businesses, is  
15                  because we have to cover large C and I, which  
16                  you didn't really get more efficiently.

17                  MR. LEDYARD: Right. Right.  
18                  Right. I mean, you guys actually went above  
19                  what we had recommended.

20                  MR. EMBREE: Right.

21                  MR. LEDYARD: So...

22                  Oh, and Pat, this is what we  
23                  were talking about earlier with the, you  
24                  know, the -- the -- the biggest -- the  
25                  biggest issues with the nonlighting was

1 simply in that documentation adjustment. And  
2 in the report we give a little bit of detail  
3 on what that -- what actually drove that.  
4 But it wasn't the actual PSD formulas or the  
5 assumptions so much as it was simply getting  
6 the right tracking savings numbers in the  
7 system for those. Again, this is 2011. It's  
8 got a minor change.

9 And that's all I had. Sorry  
10 it went long, but I'm open for other  
11 questions, concerns, comments.

12 MR. BROWN: Yeah. Great --  
13 great presentation. Thank you, Tom.

14 This is Eric with CBIA. Kind  
15 of related to Pat's question, which was  
16 focused on the nonlighting, in the lighting  
17 arena, do you have a sense of -- you talked  
18 about trends, trends there; in other words,  
19 the universe of -- of SBEA candidates that  
20 have done lighting -- or I guess my  
21 impression is completely unscientific -- is  
22 that a great deal of businesses have already  
23 done lighting retrofits.

24 Is there anything in your work  
25 that indicates that there's, sort of, the

1 size of the marketplace that's still  
2 untouched out there with respect to -- to  
3 lighting specifically?

4 MR. LEDYARD: You know, we  
5 didn't touch on this, but I'm pretty sure --  
6 actually it might even be us. I don't -- I  
7 think there's a potential study that are  
8 going to be happening in Connecticut soon, if  
9 it's not happening already. I thought that  
10 actually one of my colleagues at DNV GL was  
11 contacted to do one.

12 Does that ring a bell, Roy?

13 MR. HALLER: I haven't heard  
14 anything yet.

15 MR. LEDYARD: Because,  
16 usually, that's not part of a potential  
17 study. Because that's a legitimate concern,  
18 you know, when have you reached saturation on  
19 a measure type when you need to move on to  
20 another measure type or find the --

21 MR. BROWN: Or find, you know,  
22 underserved markets that, for whatever  
23 reason, haven't sort of caught on to this.  
24 You know, maybe the manufacturing community  
25 is going gung ho with this, but you know, the

1 office-based community has not or something  
2 like that.

3 MR. LEDYARD: Yeah.

4 Well, you bring up an  
5 interesting point. And that's one of the  
6 things that we're doing in the small business  
7 research area is we're starting to look at --  
8 we mentioned the -- the financing and some of  
9 those issues. And sometimes it's not --  
10 it's -- it's removing barriers as much as it  
11 is improving incentives or offering rebates,  
12 you know. And so part of the exercise, I  
13 think, this program is starting to go through  
14 is looking at what barriers might still exist  
15 with these other studies that could be  
16 decreased that might open up some further  
17 program activity.

18 MR. EMBREE: Yeah, I just --  
19 that, like you said, this is 2011. It is a  
20 concern. And since then, we have continued  
21 to push programs like this that are both  
22 small C and I and a large C and I.

23 MR. LEDYARD: Yeah, what's  
24 your take on that, Roy?

25 Like on this notion of the

1 small C and I market getting a little --

2 MR. HALLER: Well, I think  
3 what happens is it comes in waves because of  
4 the evolution of technology. You know, so  
5 you get to -- I mean, to your point here, we  
6 do have pockets that might be untouched, and  
7 we might have some T12s in there, for  
8 example.

9 If I had to make a guess, my  
10 guess would be that those would be in some of  
11 the more urban areas, economically distressed  
12 areas. You know, so in 2014, that becomes  
13 more of a focus, and so we're attacking that  
14 or we're addressing that.

15 The other thing that's  
16 happened is --

17 MS. LEWIS: I can't hear what  
18 is being said. Maybe if someone could  
19 summarize, repeat, or maybe you move the mic  
20 when someone is speaking.

21 MR. HALLER: So this is Roy  
22 from UI. And basically, what I was saying,  
23 Lori, was that in some areas, like urban  
24 distressed areas, there may be a tendency to  
25 have pockets of technologies that are less

1 than efficient and less than desirable.

2 We're changing those.

3 In 2011, you know, your  
4 predominance of lighting technology was going  
5 to T8s, some reduced wattage T8s. So that's  
6 something that was transpiring. Now you're  
7 looking at LEDs. You know, so that's an  
8 example of how the technology changes.

9 And, you know, I'm not going  
10 to say that there's a lot of repeat business,  
11 but if -- if you have somebody who's an early  
12 adopter on the technology side, he may see  
13 the values in going to LED lighting  
14 specifically on the exterior, as opposed to  
15 the interior, at this point. Or your space  
16 may need some upgrades for lighting and, you  
17 know, your ceiling pattern might change a  
18 little bit, so you might go to LED  
19 two-by-two. So those are some things that  
20 come into play. So I think we're addressing  
21 it. And I think we're staying at least  
22 consistent with the technology wave.

23 And to your question earlier,  
24 Eric, about financing, again, in UI  
25 territory -- and I'm sure it's fairly close

1 to small business in the CL&P territory --  
2 about 97 percent of the projects are  
3 financed. So, I mean, the predominance is  
4 financing.

5 MR. O'CONNOR: You know, Roy,  
6 this is Dennis at UI, if I can jump in.

7 And on the -- that financing,  
8 historically, we're showing about 95 to  
9 97 percent qualify for the financing. And of  
10 those, we probably have 40 percent  
11 participation for the customers that do not  
12 qualify because of poor credit. It will  
13 probably go down to about 20 percent of them  
14 decide to participate because they just can't  
15 come out of the pocket with the balance after  
16 incentive. All customers qualify for  
17 incentive.

18 MR. BROWN: Thank you.

19 MR. EMBREE: That's a great  
20 point about technology. And just the other  
21 day, I finally got to demo one of the new  
22 LEDs that would fit right into an electronic  
23 ballast so you don't have to go through and  
24 replace the fixture. And that is big for us  
25 to kind of get, because we had been reluctant

1 to kind of go halfway and then have a  
2 maintenance issue later. So that could be  
3 big for us.

4 MR. McDONNELL: And even  
5 the -- a lot of restaurants would have  
6 recessed incandescents that they want to dim.  
7 So you just have nothing to get those places.  
8 Now you can put an LED in there, and there's  
9 a lot of those options. And you know,  
10 there's a lot of T5 activity that's been  
11 measured, replaced with metal halides.

12 MR. TUMIDAJ: If I recall --  
13 this is Les -- we had an earlier discussion  
14 on small business. Maybe it was late last  
15 year. And I think you folks estimated about  
16 30 percent of the market had access, small  
17 business had been penetrated directly by the  
18 programs. That doesn't speak to spillover  
19 and so on which meant there's still a  
20 large --

21 Now obviously the rest of that  
22 market, at least presumably that market has  
23 done something during that period of time,  
24 nonetheless there is -- just suggest there's  
25 still a very significant market that would be

1 amenable to some of the high-performance  
2 lighting technologies, which also lend  
3 themselves to very sophisticated control  
4 regimens which was not the case in the past  
5 in a much more cost-effective way. So that  
6 suggests there's still a lot of potential  
7 activity out there as we're going through the  
8 cycle.

9 MR. HALLER: And this is Roy  
10 again. I'd also add to Les' comment, that  
11 some of that gets picked up with Energy  
12 Opportunities. You know, because if you have  
13 a retail establishment, let's say, maybe a  
14 national chain there, they're inclined to go  
15 with the rebate form which falls under the  
16 Energy Opportunities Program because it's  
17 easier for their methodologies. You know, so  
18 that's one example.

19 Another example is many times  
20 there's some customers out there who think  
21 that the small business prices are a little  
22 bit higher than they could get. You know,  
23 that's a true statement. It is. But they  
24 can go to the rebate, or we can serve them  
25 under Energy Opportunities.

1                   So you know, in most cases --  
2                   in many cases I think those type of customers  
3                   get served with our programs.

4                   MR. LEDYARD: Well, that's all  
5                   I had. I always appreciate the opportunity  
6                   to work in Connecticut. And I always  
7                   appreciate the opportunity to come up and  
8                   present it.

9                   MS. DUVA: Are there any other  
10                  questions on the phone?

11                  (No response.)

12                  MR. McDONNELL: I'd just like  
13                  to say the study was another great job,  
14                  high-quality result, very thorough.

15                  MR. LEDYARD: Thank you very  
16                  much. Okay.

17                  MS. DUVA: Thank you, tom.

18                  MR. LEDYARD: You're welcome.

19                  MS. DUVA: Thanks everybody  
20                  for participating.

21                  We're going to conclude the  
22                  report presentation and question and answer  
23                  session. Going once. Going twice.

24                  (Whereupon, the above  
25                  proceedings were concluded at 11:41 a.m.)

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CERTIFICATE

I hereby certify that the foregoing 76 pages are a complete and accurate computer-aided transcription of my original verbatim notes taken of the Technical Meeting in Re: 2013 - 2015 CONSERVATION AND LOAD MANAGEMENT PLAN - SBEA IMPACT EVALUATION, which was held before DIANE W. DUVA, Hearing Officer, at the Department of Energy and Environmental Protection, 79 Elm Street, Ensign Room, 5th Floor, Connecticut, on June 6, 2014.

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