



Goal 2: Commercial Quality Installation Committee Meeting Minutes
Friday, October 6, 2017

WHPA Code of Conduct: Please note that all participants of all Western HVAC Performance Alliance (WHPA) meetings, committees, working groups, and ad hoc groups shall adhere to the WHPA Code of Conduct: <http://www.performancealliance.org/Home/CodeofConduct/tabid/205/Default.aspx>.

Welcome/Call to Order

The meeting was called to order at 9:05 a.m. PDT by Chair Rob Falke (NCI).

Roll Call and Approval of September 15, 2017, Meeting Minutes

Organization	First Name	Last Name	WHPA Category	P=Present
Voting Members				
Air-Tro	Bob	Helbing	Contractor (Nonresidential)	P (only on WebEx)
All Pro Plumbing Heating and Air	Michael	Greany	Contractor (Nonresidential)	A
BMI (BuildingMetrics Inc.)	Pete	Jacobs	Energy Efficiency Program Consultant	P
Cumming Corporation	Brian	Mauleon	Energy Efficiency Program Consultant	P
Green Link Mechanical	Jerry	Hernandez	Contractor (Nonresidential)	A-sent "aye" email vote for 9/15/17 minutes
NCI (National Comfort Institute)	Rob (Chair)	Falke	Educator, Trainer	P
SCE (Southern California Edison)	Sean	Gouw	California IOU	A
Tre'Laine Associates	Pepper	Hunziker	Energy Efficiency Program Consultant	P
Non-Voting Members				
AMS (American Mechanical Services)	Marc	Pickett	Contractor (Nonresidential)	P
Lincus-Solaris	Cristalle	Mauleon	Energy Efficiency Program Consultant	P
NCI (National Comfort Institute)	Ben	Lipscomb	Educator, Trainer	P
SCE (Southern California Edison)	Scott	Higa	California IOU	P
Staff				
BJGustavson Consulting (WebEx)	Bonnie	Gustavson	Other Stakeholder	P
Galawish Consulting Associates (Staff Support)	Elsia	Galawish	Energy Efficiency Program Consultant	P

There was a quorum for approval of the September 15, 2017, meeting minutes. Rob Falke (NCI) made a motion to approve the meeting minutes and Pete Jacobs (BMI) seconded the motion. The meeting minutes were approved.



Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday, October 6, 2017

Review Agenda

Rob Falke (NCI) reviewed the agenda. Bulk of discussions will be focused on Goal 2 Work Product – “Taking AB 802 to the Field” and the Task Groups’ updates. No additional items were added.

AGENDA TOPICS	DISCUSSION LEADER
Welcome	Rob Falke
Roll Call and Approve September 15, 2017, Meeting Minutes	Elsia Galawish
Review Agenda	Rob Falke
Overview: “Taking AB 802 into the Field” Work Paper	Rob Falke
Supporting Contractor Implementation Task Group	Rob Falke
Education and Training Task Group	Pepper Hunziker
Utility Program Design and Savings Estimates Task Group	Ben Lipscomb
CQI Field Data Spec Working Group Update	Pete Jacobs
New Business	Rob Falke
Next Meeting Date, Action Items, and Assignments	Elsia Galawish
Adjourn	Rob Falke

Overview: “Taking AB 802 into the Field” Work Paper

Rob Falke (NCI) presented an overview of the Committee’s 2017 Goal 2 – provide a Work Paper identifying obstacles (when operationalizing AB 802 in the field) and solutions for engaging HVAC consumers and their contractors with requirements of AB 802 at the field level (how to make it happen).

The purpose of this Work Paper is to bring awareness to and to pose solutions that must be addressed before AB 802 can succeed in the field. The Work Paper therefore brings attention to the potential obstacles and needs facing consumers and contractors that may impede the implementation of AB 802. Each obstacle is followed by a proposed solution to that obstacle. Often times, the IOUs/implementers/regulators do not have a seat at that decision-making table, so we need to figure out how to reframe the high-level implications surrounding AB 802 that make sense to all stakeholders. Draft v1.6 dated 9-10-17 categorizes the eight obstacles included in the initial draft into three broad categories:

1. Supporting Contractor Implementation
2. Education and Training
3. Utility Program Design and Savings Estimates

It appears that the work done so far seems to be very high level at the regulatory level but has not gotten down to the IOUs as yet.

Scott Higa (SCE) – There are piloting activities that are in progress. SCE is piloting an HVAC HOPPs comprehensive value chain (CVC) program that has been approved by the CPUC. This pilot program will allow SCE to gain more knowledge on how to implement AB 802.



Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday, October 6, 2017

Rob Falke (NCI) – Overall, the Work Paper will bring inform regulators, IOUs, implementers’ sales personnel, contractors, and technicians that once it “lands on the ground,” there are going to be some obstacles; and this paper calls attention to them. These obstacles to operationalizing AB 802 will be discussed by the leads of the three Task Groups. Please note that the Work Paper is in its preliminary stage and will be finalized by the end of October 2017.

Supporting Contractor Implementation Task Group

Rob Falke (NCI) presented an overview of the Task Group’s proposed obstacles and potential solutions.

Contractors do the actual work of energy efficiency programs. Getting qualified leads into the hands of trained and able contractors is a primary attraction for contractors to participate in utility energy efficiency programs. The bulk of those leads come from smart meters and weather data. Turning that lead into a sale is critical. In order to do this, there needs to be a new generation of tools and support that allows contractors and technicians to be successful.

While the meter can provide evidence of excess energy consumption in a building, the meter cannot detect the actual cause of a poorly performing HVAC system. In the past, utility programs have been based on pre-set measures that often fail to deliver savings at the meter. Specifically, how will the contractor determine which upgrades to recommend to their customers to assure savings will be delivered at the meter?

Contractors have to determine upgrades. The sales person has to have the ability to assess the building and its needs—that is complex—assessing what is wrong and the impact on savings potential needs to be discussed. There is a need to pinpoint what needs to be done to get savings. This changes the nature of the sale. Most contractors and sales people lack the skills to identify and recommend specific custom repairs (determining upgrades) and estimate savings potential. This is complex. The rules are changing and the tools need to change. Therefore, the program needs to develop a new generation of in-field testing and diagnostic methods to identify and calculate savings.

Cristalle Mauleon (Lincus-Solaris) – This is an HVAC-wide-and-training problem for all programs, not specific to AB 802. If doing anything like maintenance, contractor will have to know how to diagnose the problems and determine what repairs are needed. Measure-focused approach will not work.

Rob Falke (NCI) – In determining an upgrade, is there a difference between existing deemed savings programs with a checklist-type of approach to a job or will this change under 802? How is the sale in the field made?

Cristalle Mauleon (Lincus-Solaris) – Do not know how it is done now, but here is my take on it. You do some form of diagnostic testing, the customer has some type of budget, and the contractor and customer work together to try to figure out within the budget what the most *bang for buck* upgrades will be. May still have to do this under CQR. Basically, have to figure out the budget, what can be done, what is missing, and what is the most *bang for your buck*? These are interconnected.

Ben Lipscomb (NCI) – I agree with her and note that the main difference going forward, especially for meter-based programs, is that you will not be able use a piece-meal approach to deliver small measures. There are program design dependencies that determine what level you need to get to. Each project has to bubble up to the level where savings can be detected at the meter. For example, coil cleaning is not a good choice for meter-based programs. Have to get a series of measures to build on top of each other to get to the threshold required by the program in order to implement the meter-based approach.

Cristalle Mauleon (Lincus-Solaris) – Determining the best measures for the system is the problem, and that will require additional tools. Rob Falke (NCI) is concerned that no one thought about the issues—how to test, diagnose, program SOW—with implementing AB 802. Each of these will be different under AB 802. This paper tries to point out the difference between how this should be and how it is now.

Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday, October 6, 2017

Ben Lipscomb (NCI) – I agree with Rob Falke (NCI). The main difference is between some prior programs that were possible under the deemed approach and what will be expected under meter-based approach. Those programs used to be able to train to a single measure. Unless those measures rise to a level that is detectable at the meter, they will not be included in programs. Programs going forward will have to include a basket of measures where savings can typically show up at the meter. A focused approach won't work for a meter-based program unless it is a big measure.

Cristalle Mauleon (Lincus-Solaris) – I suggest a holistic approach to training. With a meter-based approach to HVAC programs, have to look at the system as a whole.

Pepper Hunziker (Tre'Laine) – I agree with that statement and stress that, from a WE&T perspective, this is something that needs to be addressed on the *what*, *how*, and *when* it is evaluated.

Scott Higa (SCE) – These topics are somewhat integrated. It appears the focus of comments so far is that AB 802 and measuring savings impact at the meter. This is being viewed in the current discussion by how a contractor is going to interact with the info. AB 802 and meter-based approach to measuring savings impacts should not drive contractor behavior in terms of what they are trained on and how they are trained on implementing measures. The meter-based approach to claim savings is a different avenue for IOUs to claim savings based on all the activities contractors are doing in the field. We don't want the saving-claim method to drive technical training. We want to develop a program designed to capture all of the training's best practices and design a program to leverage meter-based savings approach around that. Does that make sense? It is up to program designers to design programs appropriately to capture large or small impact activities. Program designers have to figure out a way for that to be done. This will not occur if you have the meter-based approach drive how contractors and technicians are being trained to do their work.

Rob Falke (NCI) – Unless these things are addressed, there will be no sale. Ideas like (1) incentives can be paid a year later and/or (2) when sale is made the customer does not need to know that savings will happen or when incentives will be paid will not result in a sale. If the contractor and customer do not have that information, the info to make the decision is missing—which is what this paper addresses. What makes a sale happen?

Scott Higa (SCE) – I agree with him. From that perspective, it would be beneficial to know what info contractors need. What I've heard so far is that contractors need the incentive in order for them to close the sale. As stated before, one of the challenges of AB 802 is that the incentive is paid a year after installation. How do we overcome this barrier? Programs should be designed to allow savings to be claimed.

Ben Lipscomb (NCI) – I see Scott Higa's (SCE) comment as that programs should be designed to allow savings to be claimed for savings activities, and I agree. If there are alternate approaches, we should design in those mechanisms. At the same time, if you tell a contractor we are running this program and the program is based on achieving X-level of savings that have to be detectable at meter and the contractor can use this wide open diagnostic method that will teach how to put a proposal to get to those impacts, the contractor will be more successful at achieving that than "doing as many coil cleanings" as possible. I believe this is what Rob Falke (NCI) is getting at. We cannot continue to use the focused and piece-meal training approach if we want savings to show up at meter.

Pepper Hunziker (Tre'Laine) – Will technology be evaluated and assessed by the program or is it a free for all (i.e., any technology)? How do you monitor QA/QC of training that supports a particular technology? How do you ensure right qualifications in place for certain technologies? It seems like this is too broad for training and difficult to wrap one's hands around it. Basically, is there a shared understanding of how technologies will be approved or how they will be identified or evaluated?

Ben Lipscomb (NCI) – The IOUs or CPUC are not necessarily in the best position to drive those industry standards about which technologies are acceptable. The industry has to be responsible for this. The industry is responsible for this outside of scope of IOUs' programs. IOUs trying to step in and take another level of responsibility is redundant.



Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday, October 6, 2017

Education and Training Task Group

Pepper Hunziker (Tre'Laine) – We need to figure out how to effectively market programs to customers, inform and educate customers on energy efficient technologies, and arm contractors with marketing materials. Contractors are the primary point of contact for customers. Therefore, they need to be knowledgeable both in terms of the HVAC services they provide and of the utilities' energy efficiency programs aspects of what they are able to provide to a customer. Utilities need to train contractors in a way that they can successfully communicate with customers.

The Task Group took a slightly different approach for the QI WE&T landscape. What does this mean for implementation activities specifically? What has to be done? How should it be done? I recommend adding an addendum to this table to show how sections are interrelated – cross-referencing them.

Metered-based savings will determine savings to the customer, and sales personnel must have the ability to estimate savings to consummate the sale. As a result, there is a need to develop technical capacity, capability, and opportunities. In many cases, having opportunity to do so is a critical piece to call out. Technicians must be trained, certified, and coached to assess the performance of the system and to choose relevant upgrades. Similarly, sales personnel will require a similar level of support unless supported by an in-field technician. In addition, the technicians need the ability to communicate the value of the program and engage customers every step of the way so they are part of finding the solution.

Rob Falke (NCI) – Regarding the customer education section, what we have learned from SCE CQR program is that unless a customer was educated about the process and even involved in it, it was too big for him/her to understand. Therefore, part of technical training would be how to speak to and how to educate the customer.

Pepper Hunziker (Tre'Laine) – Recommended embedding references in the Work Paper, adding footnotes and reference points:

- a) Include reference documents that inform recommendations; for example, cross reference items with AB 802 on implementation activities.
- b) Have a visual document—a table that summarizes the various obstacles and proposed solutions and how they interrelate.

Referencing and cross-referencing will be valuable as things evolve and change, especially when going back and looking at history and context of decisions and recommendations. I acknowledge the need to include these types of cross referencing in the work paper.

Marc Pickett (AMS) – I volunteer to work with Pepper (Hunziker (Tre'Laine) on this Task Group.

Utility Program Design and Savings Estimates Task Group

Task Group team includes: Ben Lipscomb (NCI), Pete Jacobs (BMI), Scott Higa (SCE), and Cristalle Mauleon (Lincus-Solaris). Ben Lipscomb (NCI) presented an overview of the Task Group:

Energy upgrades are typically a bundled group of improvements. Since the meter is unable to identify the cause of inefficiency and pinpoint which repairs to make, how will a scope of work be determined? Furthermore, how will the impact of the upgrades be evaluated to determine the energy savings on which the incentive is paid. This will affect the decision-making ability of the customer. This gap in implementing an energy savings program has not been previously addressed at the street level because measures were deemed.

If incentives are more of a pay-for-performance type of arrangement to align with AB 802, we do not know what that energy performance looks like until a year down the road. If the incentive is based on a \$/verified net kWh, for example,

Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday, October 6, 2017

the customers and contractors do not know what to expect for the incentives, and they cannot role that into their decisions about whether to install an energy efficient measure. They do not have the spare cash to make the capital investment up front. The incentive is part of that decision. Getting some portion of incentives up front is important.

Savings estimation requires pre-and-post meter monitoring and that takes time, particularly in the post-installation period. You cannot quantify the energy savings until you have enough monitoring data under a variety of weather conditions to be able to extrapolate energy usage to a typical year. Because incentives from actual energy savings will not be determined until a year after measures are installed therefore delaying verified savings, many customers will not engage in energy efficiency programs. The benefit/incentive has to be there at the time the customer is making the decision—it is part of that decision. Need a way to reliably estimate those savings up front so that estimates can be part of the customer's decision-making process and potentially part of utility incentive calculation.

Some items have already been touched on by the previous Task Group leads. Need ability to estimate savings up front at the time of the sale, but we recognize that the savings estimated up front, particularly if used to determine the amount of incentives, need to be reconciled with the savings showing up at the meter. If the calculator or tool used to estimate savings are way off from the meter results, there will be a variance in the actual performance of program and the level of incentives paid out. Consequently, there is a need to calibrate the two tools/methods used (pre- and post-) within a certain tolerance.

There are 3-4 entities involved in verification activities:

1. IOU – Program Administrator
2. Implementer – Who presumably is bringing technology to estimate savings upfront or tool is provided by IOU
3. Evaluator – Who could be the IOU under supervision from CPUC or a third-party evaluator being paid by the CPUC.

This is tricky because you've got three entities involved, and the ability to reconcile becomes the responsibility of the middleman in each scenario, which is the IOU. The IOU's job will be to work with different technologies, tools, and providers to ensure a feedback loop with ongoing recalibration in an attempt to get those two tools aligned as often as possible.

Cristalle Mauleon (Lincus-Solaris) – I agree that the IOU is middleman to make sure the feedback loop is happening. The CPUC evaluators are ex post evaluators. For evaluating metered-based energy savings, it could be the implementer or someone under the control of the IOU—a fourth party—calculating savings claimed for each project.

Scott Higa (SCE) – I agree with the above. The incentive estimating tool benefits the IOU to increase the incentive realization rate and provides a level of assurance to the IOUs that we are paying out the proper level of incentives. We want to make that tool as accurate as possible, knowing that initially there will be some level of uncertainty in the estimates. But as we increase the sample size and info comes in, we hope to reduce the variability. This is the intent of the HOPPs HVAC proposal—to provide some type of incentive tool for the contractor to utilize, estimate savings, and continuously improve the performance of that tool.

Rob Falke (NCI) – Given the 3-4 levels of verification mentioned earlier, should we not mention that all of those need to use a similar or highly calibrated evaluation method or else we will get results that are different for same work? The tool has to be pretty substantial. Do we need to make a point in the program design that evaluation methods need to be the same if not highly calibrated?

Cristalle Mauleon (Lincus-Solaris) – I agree with him but note that you cannot use a NMEC tool to do forecasting of savings. The same inputs/data into the tools should be used. We need to ensure that the same data collected by contractors are fed into both tools.

Rob Falke (NCI) – Can these different tools be calibrated? Is it time for a program to specify an opportunity for similar methods to be used, even though calculation methods are different? There has to be a calibration method to align these two tools.



Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday, October 6, 2017

Ben Lipscomb (NCI) – Ongoing calibration is key. There are two aspects to it:

1. Inputs that go into determining those metered savings are important too, and inputs need to include data from program that gives insight into adjustments that you make or need to make in the metered analysis;
2. Take output from metered analysis (true savings) and be able to feed back into savings estimate calculator to refine estimates that produce in the future given the same input.

There is a definitely a need for ongoing calibration as well as ensuring the metered base analysis takes into consideration all the relevant inputs.

Cristalle Mauleon (Lincus-Solaris) – I agree with him. In the SCE’s HOPPs program, there is a calibration mechanism, but one of my risk concerns relates to when the CPUC conducts its evaluation. CPUC EM&V representative may make different adjustments in the NMEC analysis that was not done in the forecasting of savings resulting in a reduced gross realization rates. Have to ensure what the contractor gathered in the field and what is used in the NMEC model are similar.

Rob Falke (NCI) – This issue needs to be addressed up front for implementation of the program to be successful.

Marc Pickett (AMS) – I have and continue to battle with this issue.

Pete Jacobs (BMI) – Regulatory perspective—nature of the regulated IOUs. CPUC will always reserve the right to evaluate EE programs independently using methods they deem best. However, when evaluation studies are planned, evaluator is always looking for ways to leverage available data to come up with the best study, and a lot of work has to be done in getting everyone on board with data streams (inputs) coming out of this. If data streams are well vetted, there is no reason why they cannot be used. Leveraging good quality data from programs and mutual conversations on how data can be developed and vetted as programs and evaluations are designed will go a long way in making this a reality.

Ben Lipscomb (NCI) – There is the need to limit the upside and downside to incentives; maybe partial incentive upfront? I suggest a limit to how low or high incentives should be—maybe limit incentives based on impact. SCE HOPPs CVC program is based on meter-based savings; reference program plan for this and ensure savings are big enough to show up at the meter. Screen buildings with savings potential—potential groups of measures that may not be detectable at the meter should be placed in a pool. Regulatory issue—HOPPs requires savings at the building level even if used pooled population approach. Need to check broader portfolio requirements. Even looking at comprehensive programs, there is still a need to calculate measure-by-measure savings due to the EUL of EE activities undertaken. For example, filter replacement + duct renovation have different EULs. In this case, one has to weigh the savings to determine the EUL (composite life).

Cristalle Mauleon (Lincus-Solaris) – Because the HOPPs program bases incentive from metered data after one year, there is a NTG ratio risk (influence to customers). Training and incentive forecasting influence customers’ decisions.

Ben Lipscomb (NCI) – Look at customer incentives that can be paid upfront—use measure incentive as a means to get customers over their cash outlay barrier.

Marc Pickett (AMS) – This is not looked upon favorably—contractors do not want to be a bank. How you frame it is critical. Yearly analysis undermines the incentive.

Pete Jacobs (BMI) – Regarding the incentive discussion, all of the business decisions will be made on a risk-and-reward basis; and if the upside is sufficiently good to take the risk, there could be some incentives structures developed with an upside. Customers would be willing to wait to get it. Also, it is important to design incentives such that they motivate the right behaviors. Ultimately, it boils down to the risk-and-reward mechanism and what really motivates a customer to make an energy efficiency choice.

Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday, October 6, 2017

Ben Lipscomb (NCI) – We should not forget what economic research has taught us. One of these is that people tend to over-discount time. For example, a customer will take \$1 now before they take \$2 a year from now, even though that \$2 may represent \$1.50 today—not necessarily a straight rational economic calculation. But by delaying the incentive, a customer is losing the motivation to act.

Pepper Hunziker (Tre’Laine) – Perhaps the delayed incentive is an obstacle that we can propose solutions for. We can also reference what the HOPPs is planning to do and then propose some other solutions later. Maybe it is a higher incentive or maybe incentives go to the customer in different pieces.

Update from the CQI Field Data Spec Working Group

WG Chair Pete Jacobs (BMI) – The CQI FDS WG met 10/02/17 focused on how to get “good measurements,” best practices for field instrumentation, and how to minimize the uncertainty in the performance data that is coming out of in-field testing activities. There were robust discussions on the various types of instrumentation measurement—temperature and humidity, static pressure, and electric power—as part of the suite of performance measurements that goes into the calculations. (See WG Meeting PPT imbedded below)



10-2-17 CQI FDSpec
Meeting PPT.pdf

The next CQI FDS WG Meeting is scheduled for Monday, October 23, 2017, at 11:00 a.m. – 12:30 p.m. PDT. Discussion will focus on best practices for air flow measurements and uncertainty. Interested parties can join meeting.

New Business, Next Meeting Date, Action Items, Assignments, Closing Comments, Adjournment

No new business.

Next (last) CQI Committee Meeting is scheduled for Friday, October 20, 2017, 10:00 a.m. – 11:30 a.m. PDT.

ACTION ITEMS:

1. Three (3) Task Groups work towards submitting their recommendations to Rob Falke (NCI) on Monday, October 16, 2017.
2. Rob Falke (NCI) will update, present, and distribute final draft by Thursday, October 19. On October 20, hopefully the CQI Committee can vote on the final draft.
3. Final draft will be sent to EC for approval at their November 8 meeting.

The meeting adjourned at 10:26 a.m. PDT.

Submitted by Elsia Galawish, WHPA Staff
Galawish Consulting Associates
415-482-1079
Galawish1@gmail.com
www.performancealliance.org