



Goal 2: Residential Quality Installation Committee April 20, 2016 Meeting Notes

Call to Order

The meeting was called to order at 10:06 am PDT by Jeff Henning, Chair, President of MSDC, Inc. Jeff informed the group of his resignation as chair but his intention to remain as an active voting member of the committee.

Roll Call

5 of 9 voting members are needed for a quorum. 7 of 9 voting members, 9 non-voting members and 9 guests/staff attended. There were 26 total attendees at this meeting. Bob Sundberg facilitated the online Webex and call conference, recorded the meeting and produced summary meeting notes.

WHPA Goal 2: RQI Committee VOTING Members				Roll Call
ACCA (Air Conditioning Contractors of America)	Wes	Davis	Contractor Association	P
Benningfield Group	Russ	King	Third Party Quality Assurance Provider	
DNV GL Energy Services (formerly KEMA)	Zachary	Connolly	Energy Efficiency Program Consultant	P
Energy Analysis Technologies	Chris	Ganimian	Third Party Quality Assurance Provider	P
Mechanical Systems Design & Consulting (MSDC)	Jeff	Henning	Educator, Trainer	P
NCI (National Comfort Institute)	Scott	Johnson	Educator, Trainer	P
Henry Bush Plumbing, Heating and Air Conditioning and Home Energy Solutions (Redlands Plumbing & Heating & AC)	Tyler	Miner	Contractor (Residential)	
Roltay Inc.	Buck	Taylor (Chair)	Other Stakeholder	P
Superior Air	Larry	Kapigian	Contractor (Residential)	P
WHPA Goal 2: RQI Committee NON-VOTING Members				
ASHRAE			Engineering Society	
BuildingMetrics	Pete	Jacobs	Energy Efficiency Program Consultant	P
Building Performance Institute	Jeremy	O'Brien	Certifying Body	P
CEC (California Energy Commission)	Samuel	Lerman	Government	
CPUC/ED (California Public Utilities Commission - Energy Division)	Lola	Odunlami	California PUC	
Clean Energy Horizons, LLC	Norm	Stone	Energy Efficiency Program Consultant	
Davis Energy Group	David	Springer	Energy Efficiency Organization	P
EPA/ENERGY STAR	Chandler	Von Schrader	Government (Other than CPUC)	P
ICF International	Casey	Murphy	Energy Efficiency Program Consultant	P
Misti Bruceri & Associates, LLC	Misti	Bruceri	Energy Efficiency Program Consultant	
PG&E (Pacific Gas and Electric Company)	David	Bates	California IOU	
PG&E (Pacific Gas and Electric Company)	Marshall	Hunt	California IOU	
PG&E (Pacific Gas and Electric Company)	Swapna	Nigalye	California IOU	P
Quinn-Murphy Consulting LLC	Patrick	Murphy	Educator, Trainer	
Sacramento Municipal Utility District (SMUD)	Ravi	Patel	Publically Owned Utility	
SDG&E (San Diego Gas & Electric)	Collin	Smith	California IOU	P



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SDG&E (San Diego Gas & Electric)	Jeremy	Reefe	California IOU	P
SCE (Southern California Edison)	Lori	Atwater	California IOU	P
SCE (Southern California Edison)	Anne Marie	Blankenship	California IOU	
SCE (Southern California Edison)	Scott	Higa	California IOU	
SCE (Southern California Edison)	Steve	Clinton	California IOU	P
SCE (Southern California Edison)	Jarred	Ross	California IOU	
SoCalGas (Southern California Gas Company)	Harvey	Bringas	California IOU	
ZONEFIRST	Richard	Foster	Controls (Manufacturer or Distributor)	
WHPA Goal 2: RQI Committee Pending Candidates				
WHPA Goal 2: RQI Committee NON-VOTING Guests				
Air Conditioning Contractors of America (ACCA)	Glenn	Hourahan	Contractor Association	P
Air Conditioning Contractors of America (ACCA)	Donald	Prather	Contractor Association	P
Aire Rite Air Conditioning and Refrigeration	Don	Langston	Contractor (Nonresidential)	
Benningfield Group	Lynn	Benningfield +		
Building Performance Institute	John	Jones	Certifying Body	
California Public Utilities Commission (CPUC) - Energy Division	Pete	Skala	California PUC	
CDH Energy	Hugh	Henderson	Energy Efficiency Organization	
CLEAResult (formerly PECE)	Michael	Blazey	Energy Efficiency Program Consultant	
CLEAResult (formerly CSG)	Michael	Withers	Energy Efficiency Program Consultant	P
Field Diagnostic Services	Dale	Rossi	Third Party Quality Assurance Provider	
Galawish Consulting	Elsia	Galawish	Energy Efficiency Program Consultant	
ICF International	Ben	Bunker	Energy Efficiency Program Consultant	
Johnson Consulting**	Katherine	Johnson+		
Johnson Controls Inc. (JCI)	Bryan	Rocky	HVAC Manufacturer	P
KEMA / DNV-GL **	Jarred	Metoyer+		
National Comfort Institute	Rob	Falke	Educator, Trainer	
NIST (National Institute of Standards and Technology)	Piotr	Domanski** +		
NIST (National Institute of Standards and Technology)	Vance	Payne**+		
PG&E (Pacific Gas and Electric Company)	Chris	Li+	California IOU	
PG&E (Pacific Gas and Electric Company)	James	Tuleya	California IOU	
PG&E (Pacific Gas and Electric Company)	Mary	Anderson+	California IOU	
PG&E (Pacific Gas and Electric Company)	Sam	Choe+	California IOU	
PG&E (Pacific Gas and Electric Company)	Robert	Davis	California IOU	P
PG&E (Pacific Gas and Electric Company)	Leif	Magnuson	California IOU	P
SCE (Southern California Edison)	Andres	Fergadiotti+	California IOU	
SCE (Southern California Edison)	Sean	Gouw	California IOU	
SCE (Southern California Edison)	Ryan	Cho+	California IOU	
Tre' Laine Associates	Pepper	Hunziker	Energy Efficiency Program	P



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			Consultant	
WHPA Staff				
BNB Consulting/WHPA staff support	Bob	Sundberg	Energy Efficiency Program Consultant	P
Empowered LLC	Shea	Dibble	WHPA Co-Director	
WHPA emeritus staff	Mark	Cherniack		P

*** Organization is Not a Member of the WHPA; + Individual is NOT Registered with the WHPA
(P) following last name = Member/Registrant is Pending Approval from the WHPA Executive Committee
To avoid repetition, the name of the member organization will not be repeated in the body of the minutes; the individual names of meeting participants will be used.*

Approve Minutes of Previous Meeting

March 16 meeting draft notes were distributed March 18. No revisions or corrections were received. Finalized and approved meeting notes would be posted to the WHPA site under the RQI Committee.

AGENDA

Topic	Discussion Leader	Desired Outcome
Welcome, roll call, previous meeting minutes, new business, new members, candidates and guests	Buck Taylor and Bob Sundberg	Produce an accurate record of all attendees, finalize and approve past meeting minutes, welcome new members and guests, identify new business.
Review previous Action items and meeting agenda	Buck Taylor	Resolve older items, determine status of current action items, finalize meeting agenda items.
New Business	Buck Taylor	Make committee aware of new RQI program and/or policy issues
RQI Committee 2016 Goals	Buck Taylor	Review Goals/Implementation Plan delivered to EC
EUC/Home Upgrade and RQI program integration update	Swapna Nigalye, Lori Atwater, Collin Smith	Members understand status of program integration; incentive level realignment or other program revisions/plans for revision.
PG&E High Performance HVAC Installation study	Leif Magnuson, PG&E	Remain informed as to study status, progress and findings
CA EECC & IOU business plan development	Swapna Nigalye, Lori Atwater, Collin Smith	How can this committee provide its best input for IOU HVAC RI sector strategy and program planning?
HVAC1 Upstream HVAC Program Evaluation Results	CPUC/DNV GL posted PPT	Committee gains an understanding of the Upstream program effectiveness evaluation.
AB-802 Energy Efficiency	Buck Taylor	Stay informed as to the status of policy change from individual energy efficiency measure based claimed savings to whole building meter reading based energy savings. Implications for IOU claimed savings work papers with ex ante team and HVAC program savings evaluations with ex post team.
Set next meeting date, time and tentative agenda items	Buck Taylor and Bob Sundberg	Next meeting was tentatively scheduled for Wed. April 20. Meetings are normally scheduled the third Wednesday of each month.



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Welcome New Members and New Guests; consider new member candidates

Again, welcome Collin Smith, SDG&E Residential HVAC Program Advisor. Replaced long-term participant and contributor, JoJo Unverferth. Collin was a registered mechanical engineer and had previously worked in commercial HVAC consulting. He'd joined the residential group to help provide more technical support.

Welcome to Swapna Nigalye of PG&E. Senior Program Manager, Residential HVAC Programs. She would replace Justin Kjeldsen who late 2015 entered a program management rotation to the AG/IND sector.

Welcome new guest Katherine Johnson of Johnson Consulting. CPUC/ED EM&V consultant.

Review past Action items

September ACTION: Pepper Hunziker, Tre' Laine Associates, agreed to inform RQI Committee members about efforts of the WE&T Committee related to training/education efforts to standardize on RQI practices. Pending.

August 2015 ACTION: James Tuleya to provide Chair and staff with Home Upgrade IOU and other program representative contact information. IOU suggestion to have Lori Atwater/SCE and Leif Magnuson/PG&E continue with providing committee chair and staff with IOU HU program manager and HU Working Group contact information as well as other key HU representatives (ICF or other implementer staff) going forward.

August ACTION: Chris Ganimian would contact the HU Working Group co-directors to request attending a future meeting once Justin Kjeldsen, PG&E, had advised him that the HU Working Group had been informed about the statewide HVAC team suggestion to work together to integrate HU with the RQI program and practices. Pending

New Business

1. Jeff Henning informed committee members and guests that he'd finally decided to step down as chair after six years of leading the committee. He'd mentioned this intention the previous year but had felt uncomfortable doing so until he had a solid candidate in mind to recommend as chair to the Executive Committee (EC). He made that recommendation to the EC at their April meeting. Buck Taylor, his nomination, was discussed and approved to become the new committee chair. Jeff intended to remain active on the committee as a voting member. Committee members thanked Jeff for all of his hard work leading this group for so long and welcomed Buck to his new position. Buck looked forward to continuing the mission of the committee and possibly opening some new, additional avenues to effect change and improvement.
2. HVAC1 Upstream HVAC Program Energy Impact Evaluation Results Presentation posted by CPUC/ED March 11. Evaluation conducted by DNV GL.

<http://www.energydataweb.com/cpuc/search.aspx?did=1465>

At the bottom of the Search Criteria box on the left, go to the bottom and type in the following exact text – hvac1. This will provide access to presentation, final results report and research plan documents related to the Upstream program.

3. A CPUC/ED sanctioned California Energy Efficiency Coordinating Committee was holding a series of public meetings devoted to IOU program development termed "business development planning." The coordinating committee hosted a webinar specifically for WHPA members on March 24. It appears that these and future meetings are focused on multiple sector strategy explanations and discussions with each major IOU, not



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detailed individual program planning. It was hoped that IOU program managers would each seek direct input from relevant WHPA committees like the RQI Committee to provide program planning, claimed savings strategies and program evaluation guidance.

For more information about the CA EECC events and IOU documents please visit the CA EECC site:

<http://www.caeccc.org/>

WE&T Update – Pepper Hunziker

Pepper Hunziker, Tre' Laine Associates, provided a high level overview of statewide workforce education and training (WE&T) activities both within some HVAC programs, in public schools, trade/vocational schools, college level HVAC programs and beyond. She indicated that in addition to the WE&T Committee within the WHPA Goal 2 (which included the RQI, CQI and CQM committees), there was also a WE&T Committee within the WHPA Goal 3 Whole Building Education Committee chaired by Jake Huttner/SCE WE&T. She described efforts to gather information regarding credentialing, competency levels correlations and the value to those who'd acquired various credentials.

Buck Taylor, Chair, had concerns whether QI training based on ACCA Standard 5 & 9 was occurring anywhere beyond in the utility programs. The utility program RQI training included mentoring in the field where installations were not conforming to requirements of the standards and where verification of proper installation wasn't occurring. That was a whole process to develop a higher level of competency in the field.

Lori Atwater, SCE, added that in an earlier position at SCE she'd worked the community colleges HVAC programs. She'd come to learn that the SCE programs were probably only working with about 10% of all HVAC contractors. The community college programs represent a bridge between the current SCE RQI program "elite" contractors and the vast majority of the rest of the contracting community. They had yet to find a pathway to reach the other 90% of contractors effectively for market transformation to take place. The greater involvement of manufacturers and distributors was critical. But, to date, there not directly involved and satisfied with the status quo.

Buck Taylor agreed that how to better reach the larger range of contractors was what this committee should be working on.

Pepper Hunziker stated that a number of the community colleges had received grants to building up their HVAC programs to include training that would include a standards based level of installation. Regarding manufacturers and distributors, IHACI was involved in offering promo classes to introduce more people to the concept of standards based installations.

IOU Update on Status of Coordinating RQI and Home Upgrade Programs – collaborative promotion of RQI as preferred installation practice; inequality of contractor/homeowner incentives for same energy efficiency measure of HVAC equipment installation – Lori Atwater/SCE; Swapna Nigalye/PG&E; Collin Smith/SDG&E

Home Upgrade, Advanced Home Upgrade and RQI Program contacts and coordination

IOU program leads were asked to provide Chris Ganimian with key HU program contacts in order to invite them to attend RQI meetings and possibly have RQI Committee members attend their meetings to become better informed.

RQI PG&E High Performance HVAC Installation (HPHI) Study – Leif Magnuson

Bob Sundberg, WHPA staff, posed several questions to Leif Magnuson, PG&E regarding their HPHI study prior to the committee meeting.

<http://homeupgrade.org/grow-business/highperformance/>



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Leif provided attendees with an update prior to addressing questions about their HPHI study. They were working with three high volume contractors who did most of their work in the Advanced Home Upgrade (AHU) program. Their plan was to test out the concept within this AHU program. If successful, then they would work on how to roll it out to the Basic Home Upgrade program participants. From his perspective the big difference between those two programs tiers was that in AHU energy modeling was used to predict energy use and savings. They needed to evaluate the amount of potential energy savings which a high performance installation could add over a basic installation. For the study to proceed to a program, it would require a claimed savings work paper.

They currently had three groups of trainers working with those three AHU contractors. They planned to go into the field and measure energy usage and system performance for projects the contractors had been installation using their normal AHU approach. That would produce a baseline, how each was doing with their average installation now. The PG&E team planned to deliver customized training at the contractor's place of business to maximize installation staff participation. That training could range from deeper technical or sales training, whatever each firm most needed.

The next step would be to work with each firm on new projects with the intent to install attempting to reach the new performance targets. This would involve trying to reduce the building load on the system through selective home upgrades in order to select the correct system and equipment size to meet the performance targets. Their team would be in the field with the contractor's staff insuring the right measurements were being taken correctly for system design as well as system performance as well as afterward to confirm whether the performance targets had been met. The plan was to do this for at least two to three homes per contractor. Afterward, they would write a "lessons learned" report.

- How well were contractors able to meet the performance requirements?
- Was each firm's staff comfortable with the whole design, installation and performance verification process?
- How much extra did they need to charge their customers for all the extra work?
- Were the performance targets reasonable, could they be exceeded?
- Were these targets doable within the HU program framework?

Data collected during this study could be used in developing their claimed savings work paper. The data could also be used for codes and standards. David Springer of Davis Energy Group was contracted by their codes and standards group. They could possibly conduct work towards developing future code.

Additional questions posed to Leif Magnuson to be addressed at April 20 meeting.

Q 1) The RQI/Home Upgrade issue and how PG&E will coordinate its efforts to position HPHI with HU and Advanced HU. Also, how claimed savings is intended to be approached and how performance evaluation, which Leif referred to at the March 22 meeting, is intended to first be measured and then the methodology/protocol to project that snapshot or monitored performance to annual energy usage.

Answer 1) The HPHI approach would be positioned within the Advanced Home Upgrade tier. Whether the data collected would be enough to develop a claimed savings work paper was yet to be determined and up to their engineering staff. Data from nine installations might not be sufficient to support a work paper. Claimed savings would be based on the energy use modeling. The modeling they have used so far only could model some of the performance requirements, not all. So far, they show about a 2% increase in savings, say from 20% to 22%. That would be a 10% increase on delivered savings for an AHU project. They believe there will be considerably greater savings confirmed at the meter. But, it would take time to collect that additional meter data after the HPHI installation to prove that.

Q 2) How PG&E and other IOUs are working to establish the AB802 legislative directive to change CPUC/ED basis for claiming energy savings from individual EE measures to building meter based energy usage/savings.

Answer 2) For AHU installations they planned to begin using a meter based data analytics tool called CALTRACK.



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<http://www.caltrack.org/>
<http://www.caltrack.org/caltrack.html>

They planned to complete how they would use CALTRACK by summer 2016. They would then publish the methodologies and make available the open source code. Their goal was to establish a standardized statewide common methodology for measuring and residential installation energy savings analysis.

Their next step would be verification that the modeling for energy use and savings could be confirmed in field installations. The first use case would be to check modeling accuracy. Near post-installation data collection would be key to provide comparison with pre-installation system performance calculations. Field data would be weather normalized and compared to what the models had predicted.

They would also be able to compare contractor delivered performance and each against the expected performance (each contractor's realization rate). That type of cross-comparison could help modeling as well as contractor installation processes.

The second use case for the CALTRACK based analytics tool was a PG&E plan to also offer another pathway, one simply based on meter verified savings under efforts to comply with AB802. Rather than pay for predicted savings based on modeling tools, they would pay on savings actually realized one-year post-retrofit. Payment for performance that could be based on outcomes from a whole host of interventions.

Their intent was to explore how they might develop programs around meter based savings verification.

Bob Sundberg, WHPA staff, explained that he'd asked these leading questions because he thought the PG&E study/pilot was an effort parallel to the Commercial Quality Installation's working group (WG) effort. That WG had met the previous fall and would shortly re-commence its work to develop a standardized field measurement specification for commercial installations and then work with this committee to adapt that platform for residential installations and the CQM Committee for measuring performance of maintained commercial systems. The WG's next step would be to take the commercial installation data spec. and develop a standardized performance evaluation methodology/protocol. That effort sounded nearly identical to the PG&E HPHI residential goals.

Bob invited the PG&E team's participation on the WHPA efforts to produce that standardized data specification and performance evaluation protocol development. Pete Jacobs would be very interested to have PG&E's participation on that WG and would probably be contacting Leif soon.

Leif Magnuson added that going forward they should be able to compare the HPHI installation system performance against flagged AHU and Basic HU installations to gain more information about what degree of improved savings could be delivered by a HPHI project. The data would help reveal how compelling moving to a HPHI might be over an average installation.

Chris Ganimian, Energy Analysis Technologies, stated that he'd be very interested to learn how the HPHI results also compared to installations made within the SCE RQI program.

Leif Magnuson indicated that that would probably take the SCE staff developing CALTRACK for analysis of their RQI program installations. They'd need to have a version of its operating behind their firewall that could take in data from both RQI and HU program installations.



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Lori Atwater, SCE, confirmed that their HU program team was moving forward with CALTRACK. She would check with Denise on the timeframe. She was going to recommend that the RQI projects participating in the AHU program be included with CALTRACK modeling. She thought that would represent collaboration between the two programs.

Leif Magnuson stated that he wanted to support the committee goals to the extent that he had time to participate. He was also very interested to know more about the data which needed to be collected to develop work papers. He was confident that once they got CALTRACK tied into program participant meters, it was going to tell them lots.

Buck Taylor, Chair, emphasized that the concern of the committee was that the engineering required for compliance with ACCA Standard 5 be given due diligence for a program which was attempting to exceed the performance of an ACCA 5 based installation. Going outside of the boundaries of the standard needed to be thoroughly documented. If a manufacturer had not published some required data, you'd need to go to them to have them perform customer testing and calculations. The committee didn't want to create barriers. Rather, they intended to align methodologies. Be able to replicate results. As Leif was probably already well aware, committee members had been extremely frustrated that RQI program evaluations (EM&V studies) performed to date, there were so many overarching issues and assumptions, the evaluation reports simply tended to muddy the savings results waters. What measures were actually accomplishing which savings was often still in question. They needed to charter new pathways. What he/they didn't want to happen was for code to get credit for these additional savings and programs would not be recognized for the savings being delivered compared with actual marketplace typical installations since such a small fraction of installations were even inspected for code compliance. That approach was the operating policy of CPUC program evaluations currently. All installations met code.

Leif Magnuson explained that they were not meaning to avoid meeting ACCA 5 standards. What they intended to add was an evaluation of the actual measured equipment performance. Performance evaluation should confirm the design engineering for each system.

Buck Taylor commented that the HPHI study, he thought, was taking a very deep approach which sounded well beyond ACCA Standard 5/9 with a limited set of contractors hoping to expand contractor participation at some future time. The SCE RQI program was based on trying to deliver better performance than "to code" installations and to an expanded group of contractors. He thanked Leif for their efforts and informing the committee about plans and progress.

Leif Magnuson had a vision of future contractors being able to upload data about geo-positioned specific sites which had met performance requirements which would enable customers, installers and the utilities to track the ongoing performance of those sites, automatically. An increasing number of verified installations, with sampling to detect and obstruct any attempts at gaming the system, that would provide an ever increasing record of who was capable of installations at this level and homes where these installations have taken place. A lot more work was needed to get there, but he wanted to offer his vision of what they were aiming at.

Buck Taylor then asked Chandler von Schrader and Casey Murphy to comment from a national perspective. How would you take the RQI and this HPHI effort forward and try to expand it on more of a national level? We know that cost-effectiveness (realization rate) was a major driver for utility programs. And, from his being on the original ACCA Standard 5 committee, he recalled that they had been developing a voluntary program by contractors for contractors, not a program by utilities for contractors. How much of this could and would contractors pick up and do themselves, voluntarily? Could local market value be determined or would these more effective, efficient approaches always need to be driven by utility programs or they wouldn't occur?

Chandler Von Schrader, EPA/EnergyStar, described his involvement with the development of ACCA Standard 5 and that they didn't anticipate that utility programs would pick it up and build a program around it. They'd all worked to



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develop the standard and then there it just sat and sat and sat. Until a couple of utility programs decided that this standard might help them maximize the incentives being paid in their programs. But, they'd all been learning what a challenge it had been to get contractors capable and willing to complete ACCA 5 compliant installations and verify installation with ACCA 9. He'd concluded that the industry had suffered by the bar being set just too high. And, homeowners were just confused by the language. If this is a quality installation, what have you been doing on the rest of your work previously? He was meeting with Glenn Hourahan and Donald Prather at ACCA shortly on how these programs might be structured so requirements of the standards wouldn't be ignored. He believed that the new technologies being introduced were going to help drive work toward better installations. The NCIs, TrueTech's iManifold digital gauges and Emerson's new ComfortGuard home HVAC monitoring system. He hoped that these systems could give meaning information about whether ACCA 5 and 9 installations had been completed properly.

Donald Prather, ACCA, commented that ACCA 9 revision was almost completed and shortly would be distributed. And, that ACCA 5 allowed and anticipated advanced technologies like those Chandler had just alluded to. He didn't believe they conflicted at all with the aim of the ACCA 5 QI standard. Smart tools were envisioned as being beyond ACCA 5. ACCA 5 had always been intended to be the minimum requirement for putting in the equipment properly. They were now very interested in developing training for those standards to help more contractors reach the high bar of this minimum standard.

Bob Sundberg, WHPA staff, reminded members that Leif Magnuson had provided a link to the PG&E HPHI study that was located at the following sites in the March meeting notes distributed last month. They'd also be listed below in the April meeting notes.

<http://homeupgrade.org/grow-business/highperformance/>

Note links at the bottom of this page to draft documentation including measuring equipment and protocols and retrofit performance levels for HP installations.

<https://energyupgradeca.org/en/save-energy/home/take-control-for-savings-and-comfort/get-a-home-upgrade-and-increase-comfort>

Leif Magnuson said that there would be further updates posted to the HPHI website as the study moved along. He also would make sure this group was notified when a workshop was scheduled following completion of the study and where their contractors would be presenting their data for everyone.

Scott Johnson, NCI stated an observation. Chandler had talked about verification for the HVAC system and Donald Prather had talked about the HVAC equipment. He wanted to make the distinction between equipment capacity and what he thought they were really concerned with here – BTU capacity delivered to conditioned space by the HVAC system. He hoped everyone could be more intentional and focus on the entire system, not just equipment capacity and ratings.

Buck Taylor agreed. The RQI program's approach was concerned with system delivered performance. Instruments like iManifold didn't deliver any data about system performance, only about the HVAC equipment. Gaming automated equipment monitoring systems was pretty easy he'd found from past experience. He'd been consulted when this technology was first being designed and knew its strengths and limitations. A nominal ton of cooling capacity at the equipment was not the same as what cooling capacity would actually be delivered to the conditioned space, as Scott had pointed out. You needed to know what capacity the conditioned space required. It was all about delivered sensible heat ratio based on what the load required. Not about some number was pulled out after a building modeling. His concern with what Leif had described was how accurately were the Manual J load calculations completed, Manual S equipment selection and the commissioning to verify proper operation.



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Chandler Von Schrader commented that the issue he still had with ACCA Standard 5 was that there was no performance testing. Just follow all the rules, gather the required information and do it this way. There was still nothing to indicate what percentage of the rated BTUs were being delivered to the conditioned space at design conditions.

Donald Prather, ACCA, took issue with some of the preceding remarks. He thought that if you followed all the Standard 5 steps that the equipment would be operating properly and efficiently. Further testing would verify that.

Chandler Von Schrader stated that Donald had made his point. That the standard did not include testing which would verify that equipment performance. He was working with a subgroup with DOE and ACEEE about pushing forward with a standard that would review smart systems he'd referred to earlier which might be able to assist in verifying the installation. Having these verification technologies could greatly reduce utility program costs if their evaluations proved out. The goal was to dramatically reduce the verification costs compared with the first RQI programs like the one at SCE.

Buck Taylor argued that most of that cost was really the up-front engineering and design expense most contractors avoid, not the ACCA Standard 9 verification of Standard 5 compliance. California code required that engineering but didn't have means to enforce system engineering compliance. Code installations are considered baseline. But, he took issue with the program evaluations conducted because no one has evaluated code implementation and compliance with the load calculations like is required in ResQI. Also, there was no delta testing, no pre/post comparison at the meter or system sub meter to determine the overall impact of the new system. Those were the issue areas he'd like committee conversations to focus on in order to get all the information needed and to provide productive guidance. He thought the committee would be happy to support efforts of the subgroup which Chandler referred to.

DOE Sponsored Energy Workshop on Residential CAC and CHP Installation Roadmap

Chandler Von Schrader then extended the invitation for members to participate in the upcoming DOE sponsored HVAC installation roadmap meeting in Washington D.C. on May 12. The stated purpose was to "meet with all interested stakeholders to consider and rank alternatives for improving installations, and to develop a road map for action, including both technical and policy items." (Please refer to the email which Bob Sundberg, WHPA staff, sent to all committee members and guests April 20.) The workshop would focus first on proper installation and then on ways to properly verify it.

Bob Sundberg, WHPA staff, reminded the group that there was about 1 minute left for the scheduled meeting and they had not yet addressed the agenda item regarding 2016 committee goals. They intended to review the proposed goals which were developed by the breakout group at the November 4/5 WHPA In-Person Leadership Meeting as well as the three goal topics approved for the committee by the Executive Committee (EC) at their April 13 meeting intended to guide further refinement of goals and progress milestones by the committee.

Buck Taylor, Chair, indicated that 2016 goals would need to be dealt with at the May committee meeting.

Bob Sundberg, WHPA staff, agreed and indicated that goals which were proposed in November and which the committee had previously designated looked like they could fit under goal topics approved by the EC.



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California Energy Efficiency Coordinating Committee – IOU business plan development

<http://www.caeecc.org/#!meetings-1/p1j0q>

Coordinating Committee Meetings

- [1/15/2016 Coordinating Committee Meeting #1](#)
- [2/22/2016 Coordinating Committee Meeting #2](#)
- [3/15/2016 Coordinating Committee Meeting #3](#)
- [3/30/2016 Coordinating Committee Meeting #4](#)
- [4/20/2016 Coordinating Committee Meeting #5](#)

Residential Sector Subcommittee Meetings & Documents

- [2/23/2016 Residential Sector Subcommittee Launch](#)
- [4/18/2016 Residential Sector Subcommittee Meeting - Stage 2](#)
- [4/25/2016 Residential Sector Subcommittee Webinar](#)

Residential Subcommittee site, co-chairs and documents:

<http://www.caeecc.org/#!residential/fnza2>

Co-Chairs: Jenny Berg, BayREN; Mabell Paine, ICF International; Lisa Schmidt, Home Energy Analytics

Bob Sundberg, WHPA staff, indicated that there was one of the EC approved goal topics which he thought needed more information to develop into a goal statement. That topic dealt with the committee supporting IOU business development planning. He'd hoped they would have had time in this meeting for IOU program representatives to help inform committee members on how that strategic planning related to residential installation programs.

Jeremy Reefe, SDG&E, commented that there was a lot of activity related to this IOU planning happening on parallel paths. Bob Sundberg had already sent out some preliminary information and about meetings being held by the CPUC directed Energy Efficiency Coordinating Committee and their Residential Subcommittee. His observation was that there was a lot of talk about integrating whole building and HVAC. There was a statewide IOU effort to coordinate their overall strategies. Toward the end of the year each IOU would be finalizing what previously had been referred to as their program implementation plans (PIPs). This was all a part of the transition to a rolling portfolio and ten-year program cycle as opposed to shorter fixed year cycles to avoid the breaks in program continuity which previous short fixed year cycles invariably caused. At the IOU level, they were developing incentives around a 10-year plan. He referred to Senate Bill (SB)1414 related to HVAC equipment serial number tracking and open/closed permits as an example of items that needed to be addressed for a 10-year agenda. He thought they would be able to include "how to" questions within WHPA committee meetings to get stakeholder input. Topics like how RQI might be better integrated with EUC/HU programs. Why HVAC programs should be of great interest to homeowners who might only own a home for a few years. The IOUs needed help in writing near, mid and longer term goals.

Jeremy added that he intended to meeting with Lori, Swapna and Harvey in a week trying to figure out how they wanted to address this planning process.

Bob Sundberg requested that Jeremy and the other IOU program managers provide advance notice for when those questions were intended to be posed to the committee to insure adequate agenda time.

Jeremy stated that he'd noticed over the years as IOUs had requested input on programs from the WHPA that it was not the number one priority. But, with this change in how IOU program planning would occur going forward, this was about the only time to provide meaningful input at the beginning of the new 10 year cycle. He intended that the IOU



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team would show up with some very focused, calibrated questions. Some would revolve around permitting HVAC system installations and what “to code” installations would really mean. He thought they’d be asking committee members to respond back between the middle and end of the year on some “how to do this better” types of questions. Committee responses will inform the IOU and help in their planning process prior to deadlines for filing program plans. They intended to weave this into what the committee was already doing and not displace priorities the committee already intended to address.

Buck Taylor, Chair, commented that he hoped Jeremy and the other IOU leads would be attending the May meeting and help calibrate the committee further on those planning needs. This group of volunteers had been meeting for over six years and made quite a number of very specific recommendations regarding ResQI programs as well as state regulatory and evaluation policies already with what he considered marginal reception and little to show for all their effort. Volunteers became tired of being asked over and over again for input only to see their thoughtful suggestions seemingly ignored. The committee either needed to have its efforts and suggestions seriously considered and see some impact for their efforts or there was no real reason for the committee to continue. Not intended as a threat but he was just trying to be respectful for member’s time and efforts. Goals would be front and center at the next monthly meeting. It would be important for IOU members present next month to help lead defining the goal related to IOU business development planning which the EC topic captured.

Bob Sundberg, WHPA staff, recalled that Jeremy had stated that the IOU leads would meet the following week. He hoped that with that meeting there would be an IOU spokesperson attending the May committee meeting to help the committee better understand how they could provide the most help in that IOU planning process. How the CA EECC Residential Subcommittee meetings and efforts related to the input which Jeremy was requesting of committee members.

Lori Atwater, SCE, asked that the committee agenda include some time at the May meeting for the IOU leads. All of the IOUs had already submitted drafts. She also thought that before the next meeting they could provide everyone with a summary of the IOUs HVAC ResQI strategy.

ACTION: Lori Atwater, SCE, committed to having the IOU leads provide the RQI Committee members with a summary of the IOUs HVAC ResQI strategy.

Scott Johnson, NCI, thought that the IOUs distributing a written summary prior to the May meeting would be extremely helpful.

Bob Sundberg, WHPA staff, strongly agreed. He’d already reviewed the CA EECC Residential Subcommittee site and the IOU overview sector analysis and strategies presentations and was quite confused as to how those high level statements related to ResQI level program planning. An IOU ResQI strategy summary would be very helpful for committee members to receive and review prior to the next meeting.

Buck Taylor indicated that he thought it would be valuable to hold a conversation with Jeremy, Lori and the other IOU leads prior to the next meeting. The group deserved a one-page summary or primer on the planning process which Jeremy had just provided. The summary would be very valuable for the goals discussion that would be held at the next meeting.

Jeremy suggested they set up a time to meet with the IOU leads to get Buck and Bob dialed in. Jeremy asked that Bob send an email out per his direction for the IOU leads to talk with Buck prior to their IOU lead meeting. Then, the IOU leads would work on the document Buck requested for the May meeting.



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ACTION: Jeremy Reeve requested that Bob Sundberg, WHPA staff, send out an email for the IOU leads to talk with Buck prior to their IOU lead meeting. Following discussion with Buck, the IOU leads would develop a summary document on the IOU business development planning process for the May committee meeting.

RQI 2016 Goals – Buck Taylor

The committee didn't have sufficient time to review and discuss the 2016 proposed goals and EC approved topics. That agenda item would be taken up at the May meeting.

AB 802 Discussion

Not discussed.

Next Steps/Closing Comments/Adjournment

The next meeting was tentatively set for Wednesday May 25 10:00 to 11:30 am PDT - a 1.5-hour meeting rather than at the normal 3rd Wednesday which would have been May 18. Meetings were still normally scheduled for the 3rd Wednesday of each month.

Tentative agenda items for the next meeting would include:

- RQI C. 2016 Goals
- HU/Adv.HU programs & RQI positioning and program issues – Lori Atwater/SCE
- HU/Adv.HU representative contacts
- CPUC ED – DNV GL HUP Focused Impact Evaluation 2013-2014
- PG&E HPHI program study progress and positioning – Leif Magnuson/PG&E – link to standardized data specification, unit/system performance evaluation protocol CQI C. and RQI C. efforts
- IOU Business Development and Program Planning process/Jeremy Reeve and IOU leads
- WE&T Committee reporting on degree ACCA Standard 5/9 being actively taught in HVAC training programs outside of utility programs (union, community college, private HVAC, university, IOU training centers, IHACI) – WE&T Committee efforts to promote ACCA 5/9 inclusion in training school curricula - Pepper Hunziker
- Progress of AB 802 and progress toward building meter data as basis for document energy savings
- CPUC ED White Paper – Baseline and Admin. Law Judge call for public comments by May 17
- HVAC1 CPUC/DNV GL report on Upstream program evaluation results

Buck Taylor adjourned the meeting at 11:46 am PDT.

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ACTION Item summary below.

Summary of Action Items and Key Decisions (from above)

April 2016 ACTION: Lori Atwater, SCE, committed to having the IOU leads provide the RQI Committee members with a summary of the IOUs HVAC ResQI strategy.

April 2016 ACTION: Jeremy Reeve requested that Bob Sundberg, WHPA staff, send out an email for the IOU leads to talk with Buck prior to their IOU lead meeting. Following discussion with Buck, the IOU leads would develop a summary document on the IOU business development planning process for the May committee meeting.



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April 2016 ACTION: IOU program leads (Lori Atwater/SCE, Swapna Nigalye and Leif Magnuson/PG&E, Collin Smith/SDG&E) would provide committee chair and staff with IOU HU program manager and HU Working Group contact information as well as other key HU representatives (ICF or other implementer staff) going forward.

April 2016 ACTION: Pepper Hunziker, Tre' Laine Associates, agreed to inform RQI Committee members about efforts of the WE&T Committee related to training/education efforts to standardize on RQI practices. Pepper was going to reach out to other IOU groups to gain a better understanding of where their programs were at with respect to incorporating ACCA Standard 5 requirements in their training. She re-committed to provide an update at the May meeting.

April 2016 ACTION: Once provided with HU/Advanced HU contact information, Chris Ganimian would contact the HU Working Group co-directors to request attending a future RQI Committee meetings and coordinate RQI Committee members possibly attending HU program related meetings. Pending