

**Home Performance Flex Path  
Data Request Response  
February 5, 2013**

The purpose of this paper is to respond to questions posed by CPUC Energy Division staff during a Home Performance Flex Path (HPFP) presentation conference call on January 22, 2013. There are two primary areas of concern addressed in this response:

- The claim by SoCalREN that the volume of projects would be dramatically impacted by the number of required Base Measures- “thousands vs. hundreds” relative to the 1 of 3 approach vs. the 2 of 3 approach respectively.
- Supporting the energy efficiency loading order with an estimate based on actual Flex Path data that up to 75% of homeowners would implement at least one building shell measure under the 1 of 3 program design.

Los Angeles County has successfully piloted an ARRA funded Basic Path replacement program. The Flex Path program is a fully documented, utility scale program with measure level pre-and-post-retrofit conditions, BPI test-in and test-out for applicable measures including post-installation combustion safety testing, a highly structured online application process with supporting documentation requirements, and field quality control based on the Home Performance with ENERGY STAR program standard.

Los Angeles County committed to aggressive retrofit goals under three Department of Energy (DOE) funded ARRA grants. DOE objectives were focused on advancing market transformation, creating green jobs, and implementing pilot programs that would inform the design of future demand side management programs. Meeting these aggressive goals and objectives depended on the success of the IOU’s Advanced Path and Basic Path programs, and Los Angeles County spent millions of dollars for incentives, workforce development, and marketing campaigns aimed at driving demand to the IOU programs. When it became apparent that the IOU programs would fail to achieve even a small fraction of the needed retrofits, the Los Angeles County team was directed by DOE to implement a pilot program that could show some retrofit results to compensate for the poorly performing IOU programs. The Los Angeles County team designed and implemented the Flex Path program in January 2012.

The Flex Path program outperformed both the Advanced Path and Basic Path programs combined in Los Angeles County. This is significant because Flex Path was available for only nine months; about half the time the Advanced Path and Basic Path programs were available at the time Flex Path was closed. The Flex Path program exceeded its original retrofit goal by more than 350 percent in just nine months. It should be noted that there was virtually no marketing or advertising of the Flex Path program and retrofit results are tied directly to contractor sales efforts. It is unfortunate that critics of the Flex Path program have not taken the time to understand how well designed the program is and how efficiently it was implemented.

The Flex Path program has provided a wealth of data related to the types of measures, and combinations of measures, homeowners will voluntarily implement under a flexible, prescriptive program design. For the purposes of this response SoCalREN has analyzed sample data from 1,631 Flex Path projects.

## **The Volume Impact**

The SoCalREN has stated that the proposed 1 of 3 Base Measure program design that includes Whole House Air Sealing, Attic Insulation and Air Sealing, and Duct Sealing and Insulation or Duct Replacement will result in thousands of retrofits that support the loading order as compared with hundreds of retrofits if the 2 of 3 approach is mandated. This claim is supported by actual Flex Path data that indicates that 63 percent of the 1,631 projects reviewed included 1 of the 3 proposed Base Measures, while only 8 percent included 2 of the 3 proposed Base Measures. The ratio of homeowners that voluntarily selected 1 of 3 vs. 2 of 3 is about 8 to 1. Therefore, SoCalREN maintains that for every 1,000 projects resulting from the 1 of 3 program design there would be only 125 projects expected under the 2 of 3 program design. As these Flex Path retrofits were implemented voluntarily, it is assumed that homeowners selected the exact measures they felt best served their needs. It is not likely that the ratio would change significantly if homeowners were required to select 1 of 3 Base Measures vs. 2 of 3 Base Measures. In fact, it is reasonable to assume that the disparity in the number of retrofits would grow as the program becomes less flexible, and there is potential for an increased level of lost opportunities by requiring homeowners to implement 2 of 3 Base Measures. The 1 of 3 Base Measure approach is intended to leverage the success of the Flex Path program in order to continue learning what the market will accept in terms of volume vs. program flexibility. This is essential to understanding how a home performance program can be scaled up to meet CPUC strategic plan energy savings goals. Clearly there is more to be learned from thousands of projects as compared to hundreds of projects. Real market transformation will require a high volume of retrofit projects supported by a rapid expansion of the contractor base.

## **Supporting the Loading Order Such That Building Shell Measures Generally Occur First**

SoCalREN has proposed a mandatory 1 of 3 Base Measure design for the simple reason that it takes the highly successful Flex Path program to the next level, enhancing the way the program supports the energy efficiency loading order without making participation so restrictive that it unnecessarily limits the number of retrofits. In the Home Performance Flex Path overview presented on January 22, 2013, SoCalREN stated that it estimates that up to 75 percent of homeowners would implement at least one shell measure. Important metrics that support this estimate include:

- 63 percent of participants voluntarily selected at least one of the three proposed base measures.
- 36 percent of projects implemented one or more shell measures.
- 64 percent of projects did not include A/C or furnace replacement [it is assumed that these projects would select a shell Base Measure in the 1 of 3 program design].
- 11 percent of projects were HVAC related but also included a shell measure [it is assumed this trend would continue in the 1 of 3 program design]
- 6 percent of projects had no proposed Base Measures but included other shell measures that will trigger a shell Base Measure (wall insulation, floor insulation, radiant barrier).
- 30 percent of projects that involved HVAC equipment replacement did not include duct work or a building shell measure. Because the proposed 1 of 3 program design links Flex Measures with Base Measures these 30 percent would be required to select Duct Sealing and Insulation or Duct Replacement.

The estimate of 75 percent of homeowners implementing at least one base measure is based on the 64 percent of projects that were not HVAC related plus the 11 percent of projects that were HVAC related but also include a shell measure. The 75 percent estimate could go higher with the tiered incentive structure that can be used to expand the scope of projects, and linking Flex Measures to Base Measures.

An important element of the HPFP program will be homeowner and contractor education regarding the benefits of the energy efficiency loading order and the importance of implementing building shell measures. Contractors will perform a walk-through audit that will result in an energy efficiency roadmap for the homeowner that provides a comprehensive list of measures for future implementation. SoCalREN will offer technical support and field mentoring to improve the contractor's building science expertise with the intention of helping specialty contractors become home performance contractors over time through the acquisition of new skills.

### **Planned Changes to the BPI Air Sealing Standard**

During the 2010 development of the Energy Upgrade California Whole House Retrofit programs, BPI followed an infiltration standard for whole house air sealing whereby homes could be air sealed to as low as 0.35 natural air changes per hour (0.35 ACHn). Homes below this limit would generally be encouraged or required to install mechanical ventilation. This became the air sealing target for homes in the Basic Path program, and later, by the Advanced Path program.

In 2012, BPI announced that it would adopt the ASHRAE 62.2-2010 ventilation and infiltration standards starting January 1, 2013. In December 2012, BPI modified this statement to a "Soft" adoption of ASHRAE 62.2-2010 until ASHRAE releases the 2013 update to the 62.2 standard. The ASHRAE 62.2-2010 no longer specifies a single ACHn target—instead, the lower limit for infiltration (below which mechanical ventilation is required) is based on the geographic location, volume (floor area x height), and number of stories for the house.

In order to determine the impact of this new lower limit for building infiltration (before mechanical ventilation is required), SoCalREN examined about 500 projects that have participated in SCE's Advanced Path program. Using the pre-retrofit air infiltration data for these homes, it was determined that:

- 65 percent of homes already met the new BPI lower limit for infiltration before the retrofit started.
- 89 percent of homes were at or below 130 percent of the new BPI lower limit for air infiltration—and would not necessarily require additional air sealing.

With the implementation of ASHRAE 62.2-2010 by BPI, the majority of homes will not require additional air sealing, and if air sealing is performed, mechanical ventilation will need to be installed at additional cost to the homeowner. The energy savings for the Whole House Air Sealing measure is very small and may be further negated with required mechanical ventilation system(s). Once a home has reached this limit, the benefit of this measure is primarily an improvement in the air quality of the home. SoCalREN feels that strictly adhering to the energy efficiency loading order becomes less of an issue if the majority of homes are already tight enough without intervention.

### **Requiring Diagnostics and Testing**

In the SoCalREN HPFP program design contractors will be required to use a BPI Building Analyst (BA) to conduct a combustion safety test at the completion of all projects. This will ensure that the home is left in a safe condition after the retrofit work is complete. At the start of the project, homeowners will be advised that this test will detect any problems that may exist with combustion equipment, and necessary repairs will need to be proposed by the contractor if a problem is found.

Blower door and duct leakage tests will be required for measures that involve these features of the home. Any project with air sealing or duct sealing will be required to provide a blower door test result from the start point of work and the end point of work and may be conducted the same day as the retrofit work itself.

### **Duct Sealing Reduces Infiltration**

Energy Division has expressed some concern that with HPFP there is a possibility that, “the one of three will result in a lot of duct sealing or replacement followed by HVAC replacements and programmable thermostats or even duct work with two of the five point measures (thermostats, low flow showers and hot water wrap).” It certainly is possible that some homeowners will focus on an HVAC upgrade and that is why HPFP is designed to require sealing and insulating ducts or replacing ducts as part of a core system upgrade. Eight percent of HVAC projects also implemented at least one building shell measure, and SoCalREN is expecting to increase that number by educating homeowners and contractors about the benefits of shell measures. HVAC equipment measure requirements will exceed Title 20 and duct sealing and replacement requirements will exceed Title 24. This was first done under Flex Path and will continue with HPFP.

Duct leakage in areas where ducts run through unconditioned space (such as the attic or crawlspace), is still a source of infiltration into the home. The interior of the ducts are part of the conditioned space, and reducing the duct leakage wherever the ducts pass through unconditioned space will serve to lower the infiltration rate of the home. Thus, sealing or replacing ducts provides both a significant whole house air sealing benefit and a dramatic reduction in a home’s energy waste. For this reason, SoCalREN encourages the Commission to consider designating Duct Insulation and Sealing or Duct Replacement as a building shell measure for the purposes of the Basic Path replacement program.

### **Conclusion**

HPFP offers an on-ramp to whole house energy saving retrofits, creating a lot of buzz around more comprehensive, multiple measure retrofits, and introducing new contractors and homeowners to the home performance concept. Every project will be above a target threshold of energy savings. The HPFP program will require a BPI BA do the required diagnostics and combustion safety testing, and there will be field inspections of contractors' work to ensure quality installation.

The HPFP program design breaks down barriers to participation by removing unwanted restrictions on the work scope. The design is simple: one of three base measures will be required; a total of three or more measures from the entire list must be completed; and every job must cross the energy savings threshold set by the program. There is no modeling to learn, no extensive paperwork to complete, no energy savings

disputes, and fewer intrusive visits to the home. HPFP gets to what's important- saving energy while ensuring quality, and beginning the transformation of the home performance market.

In years to come, this program will encourage contractors to expand their skill set to offer more comprehensive scopes of work, thus greatly expanding and improving the pool of participating contractors. HPFP reduces lost opportunities by engaging more homeowners to do something that moves them toward home performance, as opposed to nothing.

SoCalREN/IOU collaboration has resulted in a number of agreements that will allow the partners to move quickly to implement a single Basic Path replacement program and other vital EUC support services in SCE and SCG service territories. The SoCalREN and IOU's are coming together in support of the 1 of 3 program design and, should the Commission support this approach, intend to complete an advice filing as early as February 2013 and not wait until April. Upon approval of the 1 of 3 Base Measure approach by the Commission the SoCalREN/IOU team will negotiate geographic territories for program implementation that do not overlap or result in duplicate efforts, and does not cause customer confusion.

SoCalREN has worked closely with SCE and SCG to reach an unprecedented level of cooperation that serves to leverage the substantial investment made by LA County in Energy Upgrade California. SoCal REN respectfully requests approval of the Home Performance Flex Path program design with its 1 of 3 Base Measure approach in order to continue piloting a simple, flexible program design that will provide invaluable market penetration data to inform the next generation of whole house upgrade programs and move the statewide team closer to reaching CEESP goals and sustainable market transformation.