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EFFICIENCY FIRST CALIFORNIA
COMMENTS ON CALIFORNIA ENERGY COMMISSION STAFF REPORT:
COMPREHENSIVE ENERGY EFFICIENCE PROGRAM
FOR EXISTING BUILDINGS DRAFT ACTION PLAN
Docket No. 12-EBP-1
(JULY 2013)

EfficiencyFirstCalifornia
Formerly CBPCA

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Introduction

Efficiency First California (EF California), formerly the California Building Performance Contractors Association (CBPCA), welcomes the opportunity to comment on and make suggestions for the *California Draft Action Plan for Comprehensive Energy Efficiency Program for Existing Buildings* (Draft Action Plan). EF California advocates on behalf of home performance contractors who participate in the various Energy Upgrade California™ programs (Energy Upgrade) and under its CBPCA brand remains California's acknowledged leading provider of Building Performance Institute (BPI) standards training. EF California/CBPCA is the current primary administrator of the Sacramento Municipal Utility District's (SMUD) whole-house performance program, the former primary administrator of PG&E's whole-house performance program, the post-retrofit Quality Assurance contractor for PG&E's efforts in the SMUD service area, and a training subcontractor for the Southern California Edison/SoCalGas program.

As we noted in our October 2012 comments on the California Energy Commission's (CEC) AB758 Scoping Report (CEC 400 2012 015), we were concerned that the Scoping Report prematurely reached policy conclusions without a deliberative and objective analytical process relying on the best available evidence. We are encouraged by the new direction the Draft Action Plan has taken. We commend Commissioner McAllister and the CEC staff on their wise selection the following high-level thematic approach, which we feel fosters fresh thinking, encourages new solutions, and supports robust private sector growth to achieve State energy goals:

1. Committing to address the more obvious structural issues facing the California energy efficiency market with "no-regrets strategies";
2. Encouraging the continued innovation of solutions in the "voluntary pathways";
3. Moving to "mandatory approaches" only after a public process to evaluate the pros and cons as well as a commitment that mandatory approaches be developed in open proceedings that address special considerations.[1]

We support the CEC's commitment to facilitate inclusive stakeholder discussion and involvement in further development of program design details. We agree that the success of the *Comprehensive Energy Efficiency Program for Existing Buildings* will depend on coordination among and commitment from all stakeholders moving forward.

We are encouraged that the CEC will create an AB758 Working Group to bring together key stakeholders (including industry professionals and representatives) and other decision makers to examine issues such as:

- Appropriate metrics for gauging overall progress;
- Data requirements for content, structure, and reporting;
- Research efforts and lessons learned;
- Evaluation, measurement, and verification of program results;

[1] *California Draft Action Plan for the Comprehensive Energy Efficiency Program for Existing Buildings*, June 2013, CEC-400-2013-006/CEC-400-2013-006-D, page 70.

- Cost-effectiveness criteria;
- Coordination among programs.

There should be transparency in the decision making process and we support the plan to ensure "the wider public will have input into efficiency programs at open meetings held periodically through the year in geographically diverse locations."[2]

In addition to our comments on the Draft Action Plan, we provide Appendices A and B containing *Efficiency First California Home Performance Contractors Desired Outcomes* and *Energy Upgrade California™ Contractor's Workflow* documents, which contain further details about opportunities for optimizing the building performance marketplace, as well as Appendices C, which contains our previously submitted comments on the Scoping Report.

Please email me with questions or points of clarification to this document: Conrad Asper, Efficiency First California/CBPCA Executive Director, conrad@efficiencyfirstca.org .

Opening Comments

Throughout our comments we plan to reiterate three overarching themes we continue to believe are critical to setting the framework for a successful home performance industry and marketplace in California.

These themes are:

1. The need for accurate, transparent, and accessible data,
2. The continuing need for "early and often" home performance contractor input at every stage of program design and implementation, and
3. The need for incentive programs to help contractors and lenders develop successful, profitable businesses that provide homeowners with a quality, affordable home energy upgrade.

1. Accurate, Transparent, and Accessible Data

The CEC has put a high emphasis on addressing the lack of access to relevant information data by making this a priority through No Regrets Strategy 1. We agree with the CEC on the importance of this issue and support any moves toward making this strategy a reality.

We advocate for improved access to utility consumption and program data, and streamlined data collection and transfer protocols that are transparent and available to all market stakeholders. To achieve these goals, we need: A common data taxonomy; industry participation in data reporting/management system design and improvements; access to energy efficiency market research and program data; data analysis tools to support business planning, investment, and innovation; easy access to utility bill data for project scoping and business planning; regular periodic access to program data to support responsive course corrections; and industry participation in program evaluation and course correction discussions.

[2] *California Draft Action Plan for the Comprehensive Energy Efficiency Program for Existing Buildings,* June 2013, CEC-400-2013-006/CEC-400-2013-006-D, page 3.

2. *Early and Often Contractor Input*

We appreciate the recent increase in opportunities for contractor input into various levels of program design and development, and we continue to advocate for the participation of contractors at higher levels of discussion and authority. We continue to believe that early consultation with leaders in the home performance industry would more quickly illuminate implementation barriers as well as provide practical suggestions for process flexibility and speed improvements.

Contractors must be ongoing, integral partners in strategic program design — not brought in after the design process to vet incremental program design updates. By including contractors in each step of developing solutions to program friction issues,[3] we can avoid the current situation in which a friction issue is raised by contractors, a solution is devised in isolation by program staff, and implementation of the "solution" creates unintended and costly consequences for contractors and their customers.

The AB758 Draft Action Plan defines building industry professionals as actors who play a "key role in the success of upgrade programs for existing buildings by providing leadership and construction knowledge during program creation, implementation, and evaluation."[4] We appreciate that recognition and would add that in addition to leadership and construction knowledge, building industry professionals are "boots on the ground" participants that bring critical feedback to program implementers and policy makers on the products and program designs they are trying to sell to customers over the kitchen table. If programs are creating or not addressing marketplace barriers, contractors will be the first to know and should be listened to as program evaluations and course corrections are considered.

Assembly Bill 32 (Global Warming Solutions Act of 2006) and AB758 are creating the road map for an unprecedented undertaking requiring the alignment of massive State, utility, and industry resources in a multi-year effort.

To meet this challenge:

> "Regulators and implementers must treat contractors less as adversaries and more as partners in this effort. Current programmatic complexity for contractors, such as complex simulation modeling, data reporting, excessive quality assurance protocols, and energy rating system complications, must be reversed. Increased direct support to contractors is needed in equipment purchases, training, and co-funding of marketing initiatives," according to the authors of *Deep Energy Savings in California Homes: A New Vision.*[5]

And we agree.

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[3] *Program friction* is defined as program steps or processes that add time or cost to the homeowner/contractor interaction.

[4] *California Draft Action Plan for the Comprehensive Energy Efficiency Program for Existing Buildings,* California Energy Commission, June 2013, page 14.

[5] "Deep Energy Savings in California Homes: A New Vision," R. Knight, Fable, S., and Brown, R., 2012 ACEEE Summer Study on Energy Efficiency in Buildings (8-169).

3. Market Driven Value

The scientific foundation of building performance provides a clear and verifiable pathway to deep and broad energy savings. This pathway both avoids missed opportunities and supports optimized project results; it also offers multiple routes to energy savings that meet a range of needs and budgets. As we design an on-ramp (i.e., a continuum of programs) to deep energy savings, building science provides cornerstones essential to strong and sustained participation by property owners and contractors. Building science also provides valuable guidance to ensure customer safety, accurately identify and mitigate liabilities caused by poor work (e.g., mold, CO), and preserve the reputation of dedicated building performance professionals who have invested time and resources to acquire the complexity of expertise needed to deliver the full benefit of a whole house energy upgrade.

If programs can be designed on building science principles and with contractor success in mind and inefficiencies in current program design can be resolved, current Energy Upgrade Participating Contractors will complete significantly more energy upgrade projects. This will in turn attract more contractors to enter the program and jobs will be done faster, more economically, and with higher rates of customer satisfaction. As stated before, it is imperative to embrace the Participating Contractors as principal allies, not potential liabilities to be guarded against.

As Commissioner McAllister states in his opening message: "Program efforts should support customer decisions with useful tools, actionable knowledge, accurate information, and access to capital, and should facilitate streamlined delivery by contractors and other building professionals who employ well designed, scalable business models. In addition, policy certainly ought not to increase nonessential transaction costs for customers or contractors."

In our Contractor Desired Outcomes document (Appendix A) we further explain that it is critical to eliminate program friction while continually increasing quality, safety, performance metrics, and proper data collection for Participating Contractors and their customers during the sale and implementation of Energy Upgrade projects.

We recognize that different IOU programs throughout the state have differing levels of program friction that complicate the process of project approval, information transfer, and incentive delivery. This friction slows the sale and/or execution of Energy Upgrade projects. We must work toward the elimination of any mandated step or process that adds time or cost to the homeowner and contractor interaction, which is already a complex process involving marketing, selling, and executing energy upgrades. A universal sense of urgency, program innovation, and flexibility must be incentivized at all levels — while continually improving quality, safety, performance metrics, and data collection needs.

No Regrets Strategy 1: Data Reporting and Management

The building performance industry depends on access to accurate data in order to deliver successful energy upgrade projects, implement effective business planning, and foster innovation. Private sector stakeholders (i.e., energy efficiency-related contracting companies and lenders) will ultimately deliver the large scale results required by State energy goals. Therefore, it is vitally important that the data reporting and management system envisioned in the Draft Action Plan uses an inclusive taxonomy that serves all

marketplace stakeholders and finds an effective balance between program/IOU raw data, privacy issues, and access — in order to achieve large scale adoption by building owners.

We agree that the California Solar Initiative model was effective in creating accessible, accurate, usable data and data management tools. We understand data reporting and management for efficiency programs may be more complex, but we support the CSI model.

We cannot emphasize enough the importance of access to accurate and usable data.

We recommend that the Action Plan clearly call for "early and often" engagement of private sector stakeholders from the energy efficiency contracting, lending, and real estate industries in the:

- NR 1.1.1 initiative that will define the taxonomy of the data system to ensure the data and access needs of these partners are effectively incorporated;
- NR 1.1.3 initiative to ensure data collection requirements for private sector partners are streamlined and do not create additional program burden;
- NR 1.1.4 initiative to ensure the rulemaking delivers data tools and resources to support the scalable growth of private sector partners needed to meet State energy goals;
- NR 1.1.5 initiative to ensure the utility bill–release requirement will support private sector business planning and innovation activities as well as program evaluation;
- NR 1.2.1 initiative to ensure the benchmark tools enable the private sector to produce the competition and innovation that will drive homeowner demand;
- NR 1.2.2 initiative to support data accuracy essential to project and financing planning and customer confidence.

In addition, we recommend:

- Energy modeling software accuracy and competition be a high priority to ensure this very important business tool is freed form a strictly regulatory goal and allowed to provide not only regulatory compliant raw building data but also contractor service features that allow one data input process and multiple competitive consumer and project planning outputs that support successful project sales and implementation.

No Regrets Strategy 2: Support for Standards Compliance and Enforcement

Standards compliance and enforcement are key to creating a level playing field in the marketplace where reputable contractors providing quality services in accordance with industry and regulatory best practices can compete and innovate. Local government funding challenges, building staff cutbacks, and increasing complexity of state energy codes have contributed to an underground market for unpermitted work. This situation is also complicated by a prevailing lack of consistency in building code requirements across adjacent jurisdictions and permitting processes that are often costly and technologically outdated. This situation creates a friction in the marketplace that penalizes companies who "play by the rules."
We recommend that the:

- NR 2.1.2 initiative explore the option to require a permit at the time of equipment purchase from the distributer including disclosure of the unit serial number;
- NR 2.1.3 initiative include training that brings together building officials and contractors for code and permitting education to foster mutual understanding of code/standards issues and better understanding/communication in the field, and that Participating Contractors be equipped with the codes/standards value proposition for kitchen table sales process and be invited to participate in homeowner outreach on this topic;
- NR 2.1.4 initiative include home performance contractors in the planning process for the online permitting system to ensure it is streamlined and fits well into an actual project planning and program incentive application process to avoid duplicative steps;
- NR 2.1.5 initiative include home performance contractors in the development of the non-monetary incentive planning to ensure an effective program.

No Regrets Strategy 3: Foundational Marketing, Education, and Outreach Resources

A home performance or energy upgrade project presents homeowners with a new science-based value proposition offering untapped benefits that comprise a complex and customizable return-on-investment opportunity. In this venture we need to see the forest AND the trees. This means providing energy efficiency education in the context of building science, loading order, and energy management, so that as homeowners make project decisions they are aware of their property's full potential, whether they opt for a code-compliant furnace replacement, a deep energy retrofit, zero-net-energy status, or something in between.

In a multiple pathway marketplace, government partners, program implementers, and efficiency professionals will be responsible for informing homeowners so they can meet their immediate needs and preserve their long-term opportunities. To this end, we recommend that the:

- NR 3.1.2 initiative include input from Energy Upgrade Participating Contractors to offer additional insight on relevant conditions in buildings identified through a pure utility bill data process;
- NR 3.1.3 initiative continue to leverage the Energy Upgrade brand to identify the new Home Upgrade program;
- NR 3.1.5 initiative engage Participating Contractors in the process of designing and implementing Energy Upgrade coop marketing tools to ensure these resources are effective and affordable;
- NR 3.1.6 and NR 3.2.1 initiatives include input from home performance contractors, and offer opportunities for Participating Contractors to participate in residential MEO activities such as Home Energy Workshops;
- NR 3.2.3 initiative include home performance contractors to offer project context and technical support;

- NR 3.2.4 initiative also include non-energy benefits and pursue means to document and quantify benefits such as comfort, indoor air quality, building durability, and health/safety including the potential for increased fire protection;
- NR 3.2.5 initiative include a process for recognizing and including private sector program participants in outreach to high priority building owners in order to expedite the education/sales process.

In addition, we recommend that MEO programs:

- Promote a "energy plan" concept to educate homeowners about their house's full efficiency-based potential and their multi-pathway options;
- Leverage High Performing Contractor protocols to recognize high quality, top performing Participating Contractors;
- Convey a sense of urgency regarding the scope and importance of meeting our energy goals to address climate protection issues;
- Leverage existing brand recognition of allied federal programs such as Home Performance with ENERGY STAR and the Better Buildings Program;
- Engage state, regional, and local elected officials, leaders, and other high-profile persons in MEO testimonial programs.

No Regrets Strategy 4: Foundational Workforce Resources

Building performance is a highly skilled profession from air sealing and insulation installation to designing a deep energy retrofit project. Training and on-the-job experience are essential to delivering the final product: measurable home performance. American Recovery and Reinvestment Act (ARRA) workforce development programs showed that obtaining an industry certification is just the beginning. Home performance professionals must not only have project assessment, installation, and health/safety expertise, they must also offer homeowner education on energy efficiency and project financing. In reality, whether a new or incumbent worker, the integration and refinement of these skill sets occurs primarily on the job.

Therefore it is important that in addition to general building science education and "stackable" certification programs, new and incumbent workers are supported with apprenticeship or "on-the-job" experience to ensure the investment in education translates into a viable career path in this emerging industry. To date, home performance companies have not been recognized or funded for the key role they play in "on-the-job" workforce development. Addressing this issue is important to growing a sustainable building performance industry for the long term. We recommend that the:

- NR 4.1.1 initiative includes specific "building science" on-ramp training tracks designed to equip aligned industry professionals (e.g., HVAC, roofing) with building performance qualifications within a specific timeframe;
- NR 4.1.2 initiative focus on providing convenient and up-to-date continuing education that follows emerging technologies and industry best practices;

- NR 4.1.5 initiative include funding for home performance companies who participate in on-the-job training, internship, and mentoring programs to compensate their contribution to workforce development;
- NR 4.2.1 initiative include home performance companies to inform industry needs assessment and delivery of appropriately trained employees;
- NR 4.2.3 initiative includes introduction of real estate and inspector professionals to local Participating Contractors to foster education and local partnerships;
- Add industry associations to Potential Stakeholders list.

Voluntary Pathway 1: Create Multiple Pathways for Residential Property Owners

To maximizing the energy efficiency potential of California houses it is essential to avoid (1) creating missed opportunities, (2) cherry picking low-hanging fruit measures (i.e., low cost, high efficiency measures), and (3) overlooking common health and safety issues. These issues are addressed by the proper application of the building science principle of *loading order*, which ensures that efficiency measures are implemented in the right order to capture the full economic and efficiency potential of the house, while simultaneously addressing health and safety issues commonly encountered during a home improvement project.

We agree that within the lifecycle of a given house, there are multiple opportunities to include efficiency measures. Whether implemented as one deep energy project or in phases over time, a home energy upgrade offers better economic value and health/safety protections when designed within the context of building science (i.e., measured home performance) to provide an energy plan for the house, as cited on Draft Action Plan page 39, that promotes informed decision making for single measure, multiple-measure, whole-house, and even zero-net-energy projects.

As building science shows, changes made to the building shell — whether as part of a deep energy project or a phased project — automatically raise health and safety issues related to ensuring healthy ventilation and proper functioning of combustion appliances. Ventilation-related issues include back-drafting natural gas appliances, moisture buildup, and mold. The first principle of the building science (i.e., measured home performance) industry is *do no harm*. Any building shell upgrade (e.g., new roof, attic sealing/insulation, new windows) affects ventilation, and can potentially contribute to unsafe conditions related to poor combustion appliance function.

Even when installed as a single measure, building science shows these common efficiency upgrades can have safety implications. In the pre-efficiency era, uncontrolled air infiltration provided through building leaks provided some ventilation mitigation; in the new efficiency era, building shell improvements must be paired with safety protocols to ensure a safe, healthy, and energy efficient home.

Other safety issues commonly encountered on home upgrade projects include asbestos duct work and knob-and-tube wiring in areas requiring insulation. Because building science views the house as a suite of systems, the process of a home upgrade is, in essence, a residential commissioning process or “home

check-up" and, as the doctor does during a health check-up, the contractor is looking at all the house's vital signs to identify problems and solutions. This residential commissioning effect is a double edged sword: on one hand it offers a comprehensive list of opportunities, on the other hand it may uncover past unpermitted work or current unsafe conditions that need to be addressed. A possible solution to this dilemma would be to offer amnesty for past unpermitted work and current safety violations if these conditions are fixed during a home upgrade project, especially if the amnesty offer was tied to a date-certain schedule.

For the above reasons, it is imperative that the marketplace and the market transformation partners effectively educate homeowners and single measure contractors providing trigger point services (e.g., HVAC upgrades, remodeling, repair or replacement of key building systems like roofs) about best practices for safely installing building shell efficiency measures, whether as a single measure, multiple measure, or comprehensive project.

Because home performance companies take a whole-house approach, it is common for contractors to offer a one-stop service providing project planning, measure installation, and assistance with incentive and financing resources. This business model lends itself to the integration of demand-side management tools such as equipment controllers and meter monitors, value-add education about plug load and occupant behavior savings, and zero-net-energy planning and implementation.

Homeowner satisfaction, the real driver of homeowner interest, depends on availability of a certified and effective workforce, and delivery of real verifiable benefits and health and safety protections. In this context, we recommend that the:

- VP 1.1.1 initiative also include rigorous and thorough engagement of stakeholders from the home performance, building efficiency–related (i.e., single measure), and lending industries in discussions about program changes, expansions, and enhancements in addition to relying on past program outcomes;
- VP 1.1.2 initiative ensure the energy efficiency value proposition is made in the context of a comprehensive inventory of the efficiency opportunities, health and safety protections, and related energy and non-energy benefits to ensure homeowners are aware of all their options at each stage in their building's lifecycle;
- VP 1.1.3 initiative (1) clearly articulates the building performance value proposition and what types of projects can or cannot deliver solutions to poor building performance (e.g., lack of comfort, poor indoor air quality, high utility bills, moisture issues), (2) assists homeowners and contractors in tracking phased projects for effective follow-up services over the life of the building, and (3) convenes stakeholders to address marketplace loopholes that may create perverse incentives that can erode the efficiency pathway potential of buildings;
- VP 1.1.4 initiative include the option to learn more about occupant behavior tools and provide these tools to homeowners as part of a whole service package;
- VP 1.1.5 initiative include further streamlining and simplifying of the Home Upgrade program processes to continue to reduce program friction (i.e., program steps or processes that add time or cost to the homeowner/contractor interaction).

Voluntary Pathway 5: Energy Efficiency in Property Valuation

Within the total home upgrade value proposition, the potential for increased resale value is a compelling return-on-investment. An energy rating provided by efficiency professionals according to an established standard is essential to establishing added property value related to efficiency. However, the ARRA-funded programs demonstrated that ratings based on asset energy modeling are costly, lack accuracy, and are duplicative of project scope analysis/testing provided by home performance contractors.

We understand that a building rating is required by California Energy Commission statue. We propose that the question of the type, depth, and frequency of such a rating system be thoroughly investigated to ensure the desired information and a level playing field are achieved without undue cost to homeowners and interference with the home upgrade project process. In addition, we propose: (1) the rating process be separate from the energy upgrade sales and implementation process and (2) the rating system be redesigned with input from building science contractors and mortgage and other lenders to ensure the rating metrics accurately respond to efficiency and financing needs. Therefore, we recommend that the:

- VP 5.1.1 initiative explore the possibility of a non-asset-based rating system before pursuing agreements with real estate and lender partners;
- VP 5.1.2 initiative conduct a pilot for a non-asset-based rating using utility bills that are calibrated against occupant data to remove behavior impacts to provide a simple, affordable, and easily repeatable rating that can be acquired by the homeowner at any point for any purpose; as the current California rating system shows, an asset rating is expensive, intrusive, and dependent on inaccurate energy modeling software originally developed for new construction that imposes limits through its default input system;
- VP 5.1.3 initiative marketing support include establishing regional networks for real estate professionals and Participating Contractors to facilitate ease of access to home upgrade services and efficiency expertise.

In addition, we recommend Voluntary Pathway 5:

- Establish a working group with real estate professionals to identify best practices for real estate professionals for incorporating energy efficiency information into the transaction process and leverage prior ARRA work on Multiple Listing Service green tool kit programs to encourage MLS adoption of searchable green fields and agent member training.[6]

[6] *Guidelines for Greening a Multiple Listing Service,* Build It Green, April 16, 2012.

Voluntary Pathway 6: Encourage Development of Innovative Financing Mechanisms for Energy Efficiency Upgrades

Affordable and accessible options for financing are essential for homeowner participation and energy reduction goals. At the kitchen table, as the homeowner and contractor design the project plan, they need access to financing options and details in an understandable clearinghouse format.

Not only is financing a tool to address the upfront cost barrier, it is also an opportunity to reward deep energy projects through mechanisms such as interest-rate buy downs and extended payment periods tied to actual energy performance. This is another opportunity to integrate actual project performance into the Energy Upgrade California program.

We agree that the goal is to establish "uniform platforms and lending requirements that can attract capital at scale and with fast, automated transaction systems for loan origination, servicing, and profiling credit risks to secondary financial markets that can enable capital access on a large scale and at terms attractive to property owners."[7] Without the fuel of large scale affordable capital, growing an efficiency industry that can meet and exceed State energy goals is unlikely. Therefore, we recommend that the:

- VP 6.2.3 initiative include contractor training in (1) current financing option features, (2) use of a program-sponsored online clearinghouse (see VP 6.2.4 below), and (3) an online comparison tool that the homeowner and/or contractor can use to evaluate options by inputting basic lending criteria (e.g., loan amount, payment period, interest rate, credit score where required, etc.) as well as estimated energy savings;
- VP 6.2.4 initiative include providing a side-by-side comparison, clearinghouse tool through the Energy Upgrade California Website that would allow Participating Contractors to easily support homeowner financing decisions during the kitchen table project design process (as was originally proposed under the ARRA program);
- VP 6.2.5 initiative include in the evaluation of financing product performance data from home upgrade projects regarding their actual energy performance based on behavior calibrated post-project utility bill data; as is true for the entire value proposition, basing evaluations on energy performance creates a level playing field for all participants;

In addition, we recommend:

- Zero-percent financing on operational capital for contractor business growth to support the expansion of energy efficiency companies in order to support a scalable, sustainable industry;
- Reward deeper energy retrofits with more affordable financing through mechanisms such as interest-rate buy downs and extended payment periods tied to actual energy performance; this strategy would not only encourage homeowners to maximize their project scope, it would also allow High Performing Contractors, who regularly achieve superior energy performance, the

[7] *California Draft Action Plan for the Comprehensive Energy Efficiency Program for Existing Buildings,* California Energy Commission, June 2013, page 62.

advantage of delivering a more attractive financing resource that rewards the homeowner for selecting a top performing contractor.

Potential Mandatory Approach 2: Disclosure of Ratings and Completion of Basic Energy Upgrades for Existing Buildings

As the marketplace verifies and recognizes the full value proposition of home energy upgrades, a case can be made for the use of mandatory approaches to drive greater property owner participation. As this issue is explored in the public process called for in the Draft Action Plan, it will be necessary to consider the current and future ability of the rating and home energy upgrade industries to support the increased demand. Therefore, we recommend that the:

- PMA 2.1.3 initiative include stakeholder collaboration to ensure the home upgrade value proposition is effectively balanced against the mandatory timeline, and that the compliance process supported by program streamline best practices to ensure property owner access to quality services;
- PMA 2.1.4 initiative provide early projections for required workforce capacity and preliminary implementation timeline for mandatory rules so that workforce development and business planning can respond to the glide path process.

Gaps

To support the thorough road map to be provided by the Action Plan, we would like to introduce the following list of gaps and recommendations, per the AB758 CEC team request:

- **Consumer Confidence:** Consumer confidence and satisfaction are essential to driving robust demand and community support for home energy upgrades. Throughout the program, from single measure, multiple measure, comprehensive measure, and efficiency/renewable projects, it will be important to deliver:
    - A total return-on-investment snapshot for home energy upgrade projects that includes energy savings; quantification of non-energy benefits such as comfort and indoor air quality, and possible fire prevention; increased resale value; and insurance discounts for the hazard mitigation effects of properly installed whole-house measures;
    - Savings guarantee insurance provided to High Performing Contractors;
    - Effective messaging on program consumer protections (i.e., Participating Contractor requirements and program backing);
    - Consistent safety protocols in accordance with national building science standards;
    - Clear systems for reporting unethical or unprofessional contractor behavior and appropriate follow-up;
    - Effective contractor and Quality Assurance staff partnerships to ensure high quality projects that protect consumer safety and industry integrity.

- **Scalable, profitable industry:** Industry growth depends on the ability to run a reputable, profitable business in a competitive marketplace that rewards innovation and superior performance. After three years and collaboration on streamlining program processes, contractors still face friction points in the marketplace that require further solutions such as:
    - Access to utility data and an effective means to ground the marketplace in actual project performance;
    - The implementation of a pro-active incentive structure across the program continuum that offers more incentive per energy unit for deeper energy retrofit projects;
    - Providing additional financing benefits to homeowners that pursue deep energy retrofit or zero-net-energy projects;
    - A choice of accurate energy modeling software tools to meet incentive program and regulatory needs as well as support project planning;
    - The elimination of any program step that adds time or cost to the homeowner and contractor interaction;
    - The establishment of a performance-based process for recognizing High Performing Contractors in the marketplace;
    - Enforcement of a level the playing field with comprehensive codes and standards compliance;
    - Support contractor participation in demand-side management with training in emerging technologies for controller and meter monitor equipment;

Appendix A:
Home Performance Contractor Desired Outcomes — The Contractor's Perspective

At the Request of the California Energy Commission

Home Performance Contractor Desired Outcomes

The Contractor's Perspective

Efficiency First California and California Building Performance Contractors Association

10/23/2012

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Introduction

At the request of the California Energy Commission (CEC), the California Building Performance Contractors Association (CBPCA) and Efficiency First California (EFC) would like to submit the enclosed list of topics that we believe, if addressed and implemented, would assure a successful market transformation with respect to AB32, AB758, and the Energy Upgrade California™ initiative. We are focusing here on describing critical issues and clarifying desired outcomes, and not necessarily solutions. Deriving solutions is the purpose of our ongoing dialogue.

Contractors' Desired Outcomes

Successfully upgrade all residential and light commercial buildings for energy efficiency in order to help the State reach its climate goals: Reaching 1990 levels of GHG emissions by 2020 and achieving 33 percent electricity from renewable sources.

To affect this outcome, we are working to:

1. Increase the quality, economic value, number, and speed of energy efficiency upgrades in buildings
2. Achieve an average of 40 percent energy savings in the State's entire housing stock by 2020 and an 80 percent savings by 2050 (reducing GHG and increasing impact of renewables)
3. Stimulate the State's economy by creating thousands of jobs at the local level
4. Transform the construction industry into experts in whole-building energy efficiency, increase public awareness of energy upgrade benefits, and build a long-term industry
5. Play a lead role in the emerging consumer-friendly market transformation known as Energy Upgrade California by maintaining effective partnerships with other market stakeholders such as local governments, investor-owned- (IOU) and public-owned-utilities (POU), and allied clean energy industries such as efficiency technology manufacturing/distribution, renewable energy generation, water conservation, and sustainable materials.

Contractors' View of Present Situation

To achieve these outcomes, **we feel that major changes must be made** to the State, IOU, and local government incentive programs that comprise Energy Upgrade California (Energy Upgrade). Factors such as the impact of the economic recession on homeowner purchase decisions,[1] homeowner perception that energy upgrades are costly, the lack of homeowner awareness of the multiple and long-term benefits of energy efficiency upgrades, the lack of affordable financing options, and excessive contractor overhead and administrative costs imposed by prohibitive Energy Upgrade program requirements have resulted in the following:

1. Market penetration, energy saving levels, and rates of energy upgrades executed are far below the early market penetration trajectory needed to meet the state-specified carbon reduction goal by 2020.

[1] See *Delivering Energy Efficiency to Middle Income Single Family Households,* Lawrence Berkeley National Laboratory, 2011, http://middleincome.lbl.gov/

2. Given the disparity between achievements and trends-to-date versus the strategic State goal, it is imperative that some of the outcomes listed below be radical improvements rather than incremental and that a sense of urgency on most topics will be necessary.

Policy Environment — Desired Outcomes

1. There is an **urgent need for higher-level regulatory and utility management support for program flexibility and speed**. Too often it seems that the implementation of important climate goals mandated by AB32 and now AB758 are relegated to lower level program managers who do not have adequate authority to take the most efficient path to achieve timely program success.

   A. **Contractor participation at higher levels of discussion and authority** would more quickly illuminate implementation barriers as well as provide practical suggestions for flexibility and speed improvements to the process. We would advocate the recruitment of the top Energy Upgrade contractors (chosen for business acumen and/or whole-systems expertise in producing 40 percent or more energy reductions) across the state to participate in program design.

2. **We support the purpose of a Home Energy Rating System** as stated in AB 758 — given the three following caveats:

   A. **Keep the home energy "rating" process separate from the energy upgrade sales and retrofit process** or create program flexibility that will allow contractors to conduct their sales and retrofit process without the *program friction* (that is, complications to project implementation caused by program processes) of accommodating a parallel and simultaneous rating process that delays project implementation, requires additional home visits, and causes consumer confusion regarding the function of a rating versus a contractor test-in/project scope inspection. The rating process should be separate and optional for Energy Upgrade customers.

   B. **Create a rating method that is supported by building scientists and contractors** — not just regulators and program managers. As currently conceived, the California Whole-House Home Energy Rating (that is, HERS Whole House Rating) is seen *as inaccurate, confusing, too costly,* and *potentially damaging to market confidence* once the inaccuracy of system's energy savings estimates are demonstrated in the marketplace. As currently conceived, the HERS Whole House Rating program is not supported by the states' leading building scientists and the majority of leading-edge home performance contractors, and its required use in the California Public Utility Commission (CPUC) building efficiency program has been deferred. This lack of support by industry experts is a huge program design schism that will drag down program implementation statewide.

   C. **Create both an operational analysis and an asset rating system (or a combination)** to serve both contractor project planning and State energy evaluation needs. Building performance contractors are concerned that confidence in performance outcomes are and will continue to be eroded by inaccurate asset modeling and a lack of post-upgrade performance data based on actual energy usage. Innovation (both in upgrading buildings and manufacturing equipment) and market financing tools are dependent on reliable and predictable energy performance outcomes.

Program Design and Implementation — Desired Outcomes

If program inefficiencies are resolved, current Energy Upgrade Participating Contractors will complete significantly more energy upgrade projects, which in turn will attract more contractors to enter the program and jobs will be done faster and more economically. Also, it is imperative to embrace the Participating Contractors as principal allies, not potential liabilities to be guarded against.

3. **Zero program friction with a continual increase in quality, safety, performance metrics, and proper data collection** for contractors and their customers during the sale and implementation of Energy Upgrade projects. Different IOU programs throughout the state have differing levels of program friction that complicates the process of project approval, information transfer, and incentive delivery, which taken together slow down the sale and/or execution of Energy Upgrade projects. **We must work toward the elimination of any mandated step or process that adds *time or cost* to the homeowner and contractor interaction**, which is already a complex process involving marketing, selling, and executing energy upgrades. **A universal sense of urgency, program innovation, and flexibility must be incentivized at all levels** — *while continually improving quality, safety, performance metrics, and data collection needs*. Contractors currently feel left out of the program design and improvement process. <u>Many Contractors are not entering this field because of program confusion and complications — others are dropping out and/or doing work outside the program.</u>

   A. **Contractors must be an ongoing, integral part of strategic program design** — not brought in after the design process to vet incremental program design elements.

   B. **Pre-project job approvals should be immediate** — with streamlined quality assurance/quality control (QA/QC) protocols implemented post-project.

   C. **Program managers and IOU sub-contractor/consultants must be incented for timely processing of projects** — to prevent departmental sub-optimization and minimize silo effects.

   D. **Separate home energy ratings from IOU Energy Upgrade program operations** — to reduce market confusion, program overhead cost (for both program managers and contractors), and program friction.

   E. **Eliminate the duplication of test in and test out** by contractor and IOU QA staff on all jobs — we recommend a phased QA process for new Participating Contractors starting with 10 percent, then 5 percent, and finally 0 percent inspections with zero program friction to process.

   F. **Create a more efficient QA/QC system that is outside of the sales and construction process**. (See Quality Assurance and Control — Desired Outcomes section.)

4. **Simplify rebate strategy and rebate process to achieve zero program friction. It is time to revisit our early assumptions around energy modeling, measuring, and administering rebates.** It should be understood that the energy modeling currently required by the program is not used by the contractors to plan or execute their work — it is solely used to determine rebate amounts. The modeling process for contractors and program managers as currently implemented is hugely expensive and creates tremendous program friction for all participants.

A. **Seek a rebate process that is simpler and less expensive.** This would save millions of dollars in program and contractor overhead. In the future, if homeowners were rewarded for additional post-project, behavior-based savings as documented through their utility bill, they would better understand their role and become active participants in the process of saving energy.

B. **Tie rebates to energy performance**, if it becomes desirable and feasible. Homeowners, contractors, and IOU, State, and local government programs must ultimately be able to produce reliable energy reductions and establish an approach to estimating energy savings that contractors and homeowners can use with confidence as they assess project benefits and value. Given the complex nature of energy modeling and the critical value (to contractors and homeowners) of a reliable approach to estimating energy savings, we propose enacting immediate pilot studies and data collection around various solutions to this issue with the goal to achieve a workable approach by 2015.

   i. **Leverage rebates based on reliable energy savings estimates to support contractor sales process**. By providing a simplified, more accurate, and less costly rebate process that includes energy bill calibration and produces reliable energy savings estimates , contractors would be more likely to guarantee savings and rebate amounts within an acceptable range because they would very quickly learn what combination of measures are most effective in actual energy reduction.

Workforce Development — Desired Outcomes

The success of the entire building efficiency program depends on qualified contractors executing high-quality jobs profitably and rapidly. Currently, we have many technically trained contractors but simply do not have enough advanced training in the full range of relevant topics including competence in business, marketing, quality, and installation expertise.

5. Fund more widespread and more broadly defined **technical training and mentoring at installation level** — do not emphasize auditing/rating as sole training requirements.

6. Also fund **marketing, sales, and business management training** for home performance companies.

7. Deliver sufficient **pre-qualified, credible, new-hire candidates** to upgrade contractors through workforce development programs, community colleges, and trade tech systems. Finding qualified new-hires for field crews is currently a huge bottleneck.

8. **Commit to BPI Certification and Standards** as the foundation of the workforce.

9. **Avoid "retooling"** required certifications with each new program cycle

10. Offer incentives and/or **financing for necessary contractor investments** in equipment.

11. Participate actively in **national efforts to improve standards and certifications** that will create consistent training and certainty for contractor investment.

Public Education and Marketing — Desired Outcomes

The vast majority of the public has not yet heard of Energy Upgrade California, or that buildings are the largest contributors to global warming in the U.S. and that there is a solution (whole-house upgrade) that also provides multiple other economic and life-enhancing benefits.

12. **Urgency, visibility, and validity about the power and benefits of energy efficiency**.

    A. **Convey a sense of urgency** to the public about of the size and scope of our energy and greenhouse gas emissions problems and the incredible power of building efficiency to provide a solution.

    B. Make sure marketing programs leverage **on-going and frequent validation from the most visible politicians and state leaders** — IOUs, CPUC, CEC, Governor, Senators, Mayors, Supervisors, movie stars, and other high-profile and respected leaders.

13. Whole-house upgrades should be marketed as **the "ultimate step" that offers more total value than the many simpler single-measure options** by all IOU and local government programs and contractors. Combine whole-building upgrade marketing with all other efficiency opportunities, including behavior change, in all State, County, and IOU energy efficiency education efforts.

14. **Institute *hyper-local* marketing/education programs** that coordinate City Hall and community organizations with specific contractors for both wide and deep penetration within individual cities and then co-fund the Cities' marketing efforts.

15. Use flexible and substantial **coop marketing to optimize Participating Contractor marketing costs**.

16. **Leverage federal programs** for messaging and marketing content (such as Better Buildings or Home Performance with ENERGY STAR) that will have broad market recognition.

Consumer Financing — Desired Outcomes

Affordable and accessible financing is a key tool for building homeowner participation in the current economy. Studies show that consumers respond to financing programs that offer 5 percent or lower interest rate. Providing a variety of affordable financing tools that can be accessed "at the kitchen table" during the sales process would enable contractors to provide solutions for a range of financing needs. To provide affordable and accessible financing, we recommend the following:

17. Seek financing options and partners that **are scalable and sustainable**.

18. Engage private investment capital with **strategies similar to present solar leasing**.

19. Support **on-bill financing or repayment options** with either utility or third-party lenders.

20. Implement **loan-loss reserves** to stimulate interest rate reduction by lenders.

21. Stimulate **Property Assessed Clean Energy** (PACE) concept options.

22. Encourage the use of the **Energy Efficient Mortgage** (EMM) program and engage local mortgage broker and realtor partners trained in EEM implementation.

Administration and Reporting — Desired Outcomes

23. Conduct ongoing assessment of **aggregated savings versus incentives paid**.

24. **Use random sampling to confirm energy savings** on an aggregate basis, not every home.

25. **Compare/refine predicted versus actual achieved savings** per normalized utility bill data.

26. Support development and adoption of **national standards** for data collection, calibration, and data transfer protocols.

Quality Assurance and Quality Control — Desired Outcomes

We believe that QA/QC is essential for public good, quality assurance, and contractor monitoring/education. The QA/QC process must also be efficient and practical for all parties.

27. Assure contractors/raters are **fully informed of proper practices**; **enforce on a regular basis**.

28. **Assure contractor capability** through training, certification, mentoring, and quality verification (but keep it out of homeowner/contractor sales and construction process).

29. **Emphasize safety training, verification, and sanctions**, especially in combustion safety.

30. **Use field job verification as mentoring** (keeping it out of the sales/construction process), and include clear sanctions against repeat violators.

31. Provide expert advice to contractors via **online references plus field support on request**.

32. **Create robust feedback mechanism for homeowner** satisfaction or complaint with rapid follow-up procedures.

33. Need **clear system for reporting unethical or unprofessional contractor behavior**; recommend use BPI delisting process.

34. **Ensure protocols** (for example, BPI's Accreditation model) that minimize program expense and provide adequate oversight of the end product.

    A. QA inspectors should be **qualified to at least the same level as the contractors**.

    B. QA inspectors should be **third-party (non-implementer staff)** certified quality control inspectors preferably in BPI's Quality Assurance network.

    C. **QA costs should be fixed and predictable** if passed through to the contractors (or else exclusively paid by the program).

    D. **QA protocols should follow the performance standards adopted for the participant certification** for the entire program (BPI Standards for retrofit programs).

Appendix B:
Energy Upgrade California™ Contractor's Workflow

ENERGY UPGRADE CALIFORNIA™ CONTRACTOR'S WORKFLOW

INTRODUCTION:

The goal of the home performance industry is to reduce energy consumption in California homes, drive wealth to families through lower energy bills, reduce carbon emissions, and create thousands of jobs and small businesses. We strive to develop a system where energy efficiency is treated as a resource and public programs are designed to support private enterprise, investment, and innovation.

This document describes the sales process for a home performance project and visually outlines the pros and cons of (1) the current home performance workflow under the IOU Whole House Upgrade Programs as implemented under Energy Upgrade California (Energy Upgrade) and (2) the contractor's ideal workflow that provides homeowner friendly, minimally disruptive project delivery (see *Figure 1: Workflow under Energy Upgrade California Program* and *Figure 2: Best Case Scenario – Ideal Number of Home Visits*).

Most homeowners discover the whole-house approach to energy efficiency through a "pain point" such as a furnace replacement, high energy bills, or a cold and drafty house, or while planning a remodeling project. As a *considered purchase*, a home performance project is typically sold because the contractor is able to diagnose the problem, explain its causes, and implement an integrated solution tailored to that homeowner's goals and budget. In his/her role as "house doctor," the home performance contractor uses good communication skills, building science techniques, and years of construction experience to create a custom plan to provide not only energy savings, but additional non-energy benefits that are often the "deal makers," such as comfort, good indoor air quality, home safety, improved building durability, and the potential for increased resale value — to deliver a total value proposition that goes beyond simple return-on-investment.

Making changes to a home, whether a remodel or home performance upgrade, requires homeowner participation and disrupts the household as work is performed. Current Energy Upgrade duplicative QA testing creates an additional challenge: homeowner confusion. Home performance contractors are equipped to address these challenges using industry best practices and building science standards to deliver maximum energy performance results with minimum demand on homeowner time and resources. The recommendations in this paper are designed to leverage the experience of home performance contractors to improve the workflow of the Energy Upgrade California program and generate successful projects with verifiable savings, customer satisfaction, and ultimately widespread uptake.

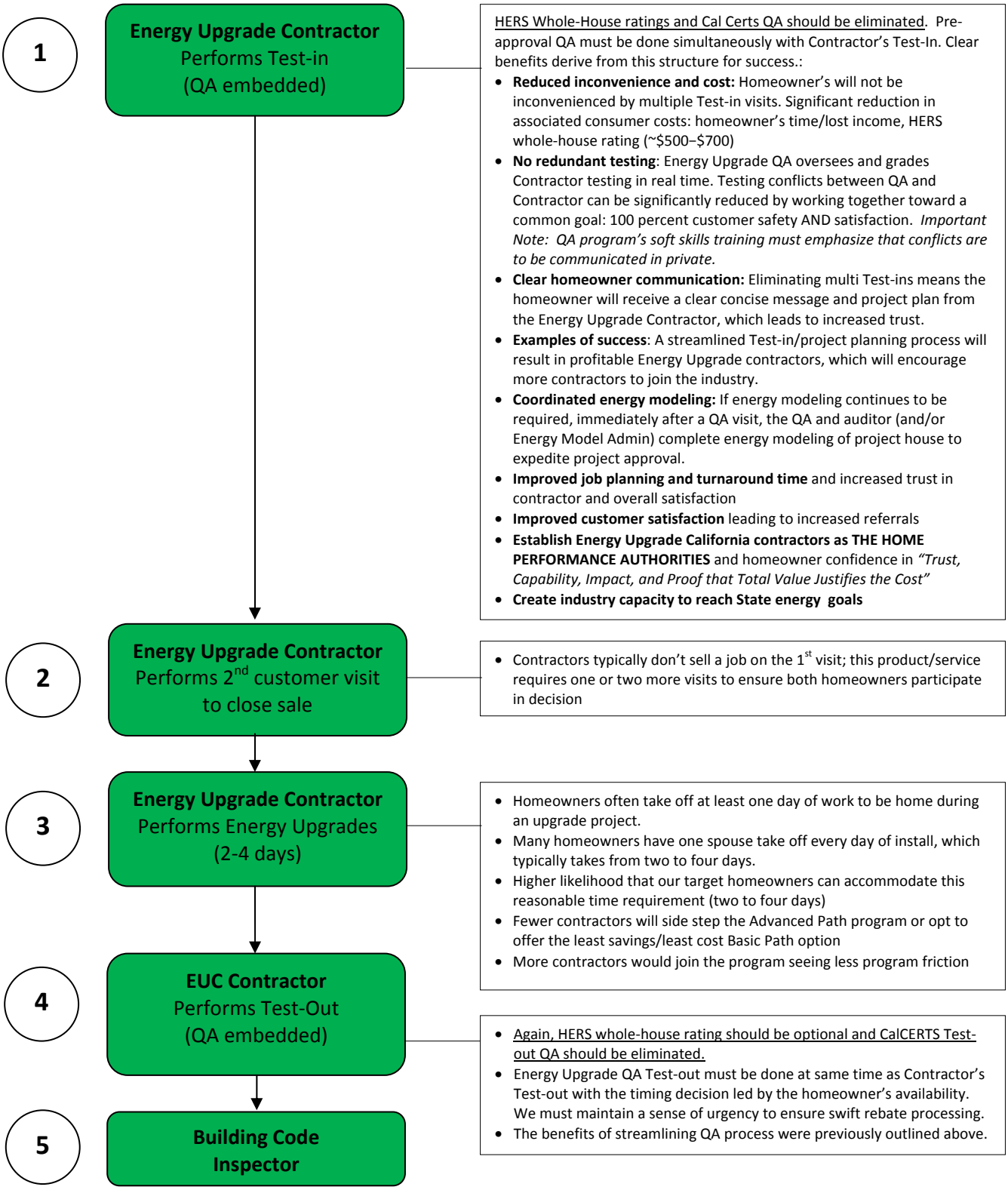
Figure 1: Workflow under Energy Upgrade California™ Program

Key: REINFORCE | REVISE | REMOVE

All homeowner costs below assume a 2,500 sq. ft. or less home with one HVAC system.

1. **Energy Upgrade Contractor** and Customer make contact
   - Most leads are directly generated by the contractor's outreach to their existing customer base by up-selling services, by creative lead generation, and/or by converting traditional inbound contact streams from one upgrade to multiple line item projects.
2. **HERS Whole House Rater** Performs Rating on Home
   - ~$500 to $700 fee — high upfront cost to homeowner.
   - No work scope developed and likely no combustion safety test conducted.
   - HERS topic can be used to promote consumer rights protection option.
   - Asset rating doesn't provide accessible info on how the energy upgrades improve homeowner's quality of life, reduce their energy use, and provide energy and non-energy value.
   - HERS rater discussions with homeowner lack sense of urgency and/or upgrades are highlighted in improper loading order coupled with unrealistic pricing . Information provided to homeowner by multiple providers can be conflicting.
3. **Energy Upgrade Contractor** Performs 1st visit, Test-in and CAZ
4. **Energy Upgrade Contractor** Performs 2nd/3rd customer visit to close sale
   - Contractors typically don't sell a job on 1st visit, this product/service can require one or two more visits
   - To educate customers on the full value of this "considered purchase" takes time, effective communication, and trust
   - Sponsor trainings for contractors on phone sales and building trust
5. **Energy Upgrade Program Manager** Requires Test-in QA
   - Difficult and inconvenient for homeowners to accommodate multiple Test-in visits with Rater, Contractor, and QA
   - Multiple Test-ins cause confusion about who the expert is and interferes with building customer/contractor trust and establishing the communication needed to convert a lead into a project
6. **Energy Upgrade Contractor** Performs Energy Upgrades (2-4 days)
   - Homeowners often take off at least one day off work to be home during an upgrade project
   - Many homeowners have one spouse take off every day of install, which typically takes from two to four days
7. **EUC Contractor** Performs Test-out and CAZ
8. **Program Manager** Requires Test-out QA
   - Necessary in moderation. First few jobs require QA until contractor demonstrates proficiency followed by spot checks. Every job submitted between QA visits should be fast tracked for high quality, high volume contractors In order to meet State energy goals.
   - QA must not be compromised. Focus on punishments for violations (up to and including delisting) rather than higher QA rates.
9. **HERS Whole House Rater** Performs Rating after Energy Upgrade is complete
   - Optional; homeowner needs to understand the value-add of a rating and that it is not required to complete a project
   - Difficult to coordinate Rater visit with Energy Upgrade contractor
   - $250 to $750+ cost depending on size of house, and who performed test-in and/or HVAC compliance verification
10. **CalCERTS QA** QA HERS Whole House Rater
    - Redundant QA process, must be eliminated to streamline
    - Repeats Energy Upgrade contractor Test-out
    - Difficult to coordinate QA visit with Energy Upgrade contractor and homeowner
    - We recommend using the National BPI QA model instead of State-specific requirement
11. **Building Code Inspector**

Figure 2: Best Case Scenario —Ideal Number of Homeowner Visits



CONCLUSION:

Our goals are consistent with your goals. The current energy efficiency program is not designed to allow California to even come close to its goals. Streamlining will undoubtedly increase contractor participation and drastically increase the number of jobs performed. The high number of homeowner touch points, homeowner confusion, and the likelihood they would walk away from best home improvement they could ever make will be minimized. Let's work together to streamline the process for the betterment of all Californians and Energy Upgrade California contractors who want to rebuild it right. Again, we strive to develop a system where public energy efficiency programs are designed to support private enterprise, investment, and innovation, not hinder it. It's time we move forward together to reach our common goal. We thank you for your time and consideration.

Appendix C:
Efficiency First California Comments on California Energy Commission Scoping Report

EFFICIENCY FIRST CALIFORNIA AND
CALIFORNIA BUILDING PERFORMANCE CONTRACTORS ASSOCIATION
COMMENTS ON CALIFORNIA ENERGY COMMISSION STAFF REPORT:
COMPREHENSIVE ENERGY EFFICIENCE PROGRAM
FOR EXISTING BUILDINGS SCOPING REPORT
(August 2012 — CEC-400-2012-015 — Docket No. 12-EBP-1)

October 23, 2012

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Appendix A: *Home Performance Contractor Desired Outcomes*

Appendix B: *Energy Upgrade California™ Contractor's Workflow*

Introduction

Efficiency First California (EFC) and the California Building Performance Contractors Association (CBPCA), which represent home performance contractors throughout California, welcome the opportunity to comment on and make suggestions to the *Comprehensive Energy Efficiency Program for Residential Buildings Scoping Report* (Scoping Report). CBPCA advocates on behalf of contractors who participate in the various Energy Upgrade California™ programs and is California's acknowledged leading provider of Building Performance Institute (BPI) standards training. CBPCA is the current primary administrator of the Sacramento Municipal Utility District's (SMUD) whole house performance program, the former primary administrator of PG&E's whole house performance program, the post-retrofit Quality Assurance contractor for PG&E's efforts in the SMUD service area, and the sole training subcontractor for the Southern California Edison/SoCalGas program.

A fundamental concern we have with the Scoping Report is its appearance, at times, as a conclusive policy report rather than a true scoping report that identifies problems or issues and a methodology to gather relevant data for the purposes of analyzing such problems and complying with the requirements of AB758 (discussed below) in a subsequent document. In some cases, the Scoping Report appears to reach certain conclusions prematurely without proposing or undertaking a deliberative and objective analytical approach relying on the best available evidence.

Also, AB758 requires the Energy Commission, in developing the program requirements, to consider, among other things, "the most cost-effective means and reasonable timeframes to achieve the goals of the program" and requires the program, in absolute terms, to "minimize the overall costs of establishing and implementing comprehensive energy efficiency requirements." It is unclear from the Scoping Report whether the Energy Commission has complied with or intends to comply with these requirements. We believe it is incumbent on the Energy Commission to undertake a thoughtful cost-effectiveness analysis of various compliance pathways, as early in the development of the program as possible, to fully comply with the requirements of AB758 and to demonstrate to the Legislature that it has complied with its mandate to the fullest extent possible.

Accordingly, we request that the Energy Commission clarify the specific evidentiary steps it intends take in order to build a meaningful and informative record on which to tackle the challenge of improving the energy efficiency of the state's existing buildings. The Energy Commission should also clarify whether it intends to release for public review and comment the deliverables, including the "needs assessment" prepared by its consultant pursuant to the AB758 Technical Support Contract Scope of Work (attached). It is possible that much of the data or information serving as the basis for the Scoping Report was collected from these deliverables. If so, the public would undoubtedly benefit from the release of this information.

Finally, we encourage the Energy Commission staff to meet with key stakeholders and create key-stakeholder task groups to work together on creating an actionable plan with which to move forward.

Included in this document are the *Home Performance Contractors Desired Outcomes* and *Energy Upgrade California™ Contractor's Workflow* documents in appendices A and B, which contain further details about opportunities for optimizing the building performance marketplace.

Please email me with questions or points of clarification to this document: Conrad Asper, Efficiency First California/CBPCA Executive Director, conradasper@thecbpca.org.

Growing a Scalable Marketplace to Meet State Energy Goals

As the Scoping Report states: "A capable and committed contractor community, a sufficiently aware population of building owners, and simple access to affordable capital are fundamental requirements for achieving scale in the state's building upgrade activity.… In a pragmatic and structural sense, **it is contractors who must drive the retrofit marketplace**; **they must have the tools and program support to do so effectively and efficiently**. At the same time, they and other actors … must **be aligned and committed to the best interests of the upgrade customer**."[1]

Efficiency First California and CBPCA agree.[2]

As the second largest source of California greenhouse gas emission, buildings represent a powerful opportunity to address environmental and economic challenges through the widespread upgrade of existing residential and non-residential buildings. To meet this goal requires upgrading millions of California homes and businesses, engaging thousands of qualified building performance companies, and making energy upgrades the most popular building improvement project.

According to *Deep Energy Savings in California Homes: A New Vision*: "Among the initiatives supporting AB32, the Public Utilities Commission's *Energy Efficiency Strategic Plan* sets a target for the state's entire existing housing stock to achieve an average energy efficiency savings of 40 percent from 2008 levels by the end of 2020.… By 2050, the State's AB32 carbon reduction goal is increased to 80 percent of 1990 levels, requiring unprecedented future savings requirements in all energy sectors including all existing housing units."[3]

The *New Vision* report goes on to state the 11.5 million dwelling units served by California Investor Owned Utilities represent 85 percent of the state's total housing stock and include 4.8 million (41 percent) single-family, owner occupied homes, 3.8 million (33 percent) single-family renter occupied homes, and 2.3 million (20 percent) multi-family units.

To calculate how many building performance companies will be needed to meet this demand, we assume each Participating Contractor company will need to be a professionally managed energy retrofit division or stand-alone company capable of producing three residential retrofits per week costing on average

[1] *Comprehensive Energy Efficiency Program for Existing Buildings,* California Energy Commission Staff Report, August 2012, CEC-400-2012-015, pages viii and ix.
[2] See Appendix A: *Home Performance Contractors Desired Outcomes,* Efficiency First California/CBPCA, September 2012, Policy Environment (#1) and Program Design and Implementation (#3A).
[3] *Deep Energy Savings in California Homes: A New Vision,* R. Knight, Fable, S., and Brown, R., 2012 ACEEE Summer Study on Energy Efficiency in Buildings (8-169).

between $14,000 and $20,000 per project to produce 150 projects per year with annual revenues of approximately $3 million while hiring a minimum of 20 employees each.

With above assumptions, we will need a total of 7,700 Participating Contractor companies including 3,200 to upgrade the single-family owner occupied homes eligible for State program incentives, an additional 2,533 companies to upgrade single-family renter occupied homes, and 1,533 companies to upgrade multi-family properties.

This is an unprecedented undertaking requiring the alignment of massive state, utility, and industry resources in a multi-year effort. To meet this challenge: "Regulators and implementers must treat contractors less as adversaries and more as partners in this effort. Current programmatic complexity for contractors, such as complex simulation modeling, data reporting, excessive quality assurance protocols, and energy rating system complications, must be reversed. Increased direct support to contractors is needed in equipment purchases, training, and co-funding of marketing initiatives," according to the authors of *Deep Energy Savings in California Homes: A New Vision.* And we agree.

To establish a scalable marketplace capable of this task, we believe the State, in collaboration with contractors and other stakeholders, must create an exciting, innovative, and cost-effective environment that can attract the thousands of building performance companies needed for the job. The State must also support early adopter companies that take the risk to demonstrate the potential for success to contractors considering investing their time and money in the building performance industry. If we don't make this new marketplace compelling and exciting, we will not reach our program goals and/or our desired outcomes (see Appendix A — *Home Performance Contractor Desired Outcomes*, Introduction and Contractors' Desired Outcomes sections).

Energy Assessments and Ratings — Residential Buildings

As discussed in the Scoping Report: "Public Resources Code Section 25942 requires the Energy Commission to establish the California HERS Program to certify home energy rating services in California. The statute requires that ratings be based on a single statewide rating scale and include estimates of potential utility bill savings and recommendations on cost-effective measures to improve energy efficiency. The statue requires the Energy Commission to develop training, certification, and quality assurance procedures for Raters; database and reporting requirements; and labeling procedures. The statute prescribes that once the Energy Commission adopts the California Home Energy Rating System through regulation, no home energy rating services may be performed in the state unless the services have been certified by the Energy Commission to be in conformity with the program criteria adopted by the Energy Commission. The program goal is to provide reliable information to differentiate the energy efficiency levels among California homes and to guide investment in cost-effective home energy efficiency measures."[4]

Pursuant to the above authority, which became effective in the early 1990s, the Energy Commission developed an asset rating system for rating new homes. Over time the Energy Commission staff attempted to adapt the rating system to existing residential buildings. At first, the home performance contractor

[4] *Comprehensive Energy Efficiency Program for Existing Buildings,* California Energy Commission Staff Report, August 2012, CEC-400-2012-015, page 49.

community agreed with and supported this vision, but as the system has been tested over time for the existing residential market, the ideas and opinions of the HP contractor community have matured and we now recognize that this approach is extremely costly, inaccurate, confusing to home owners, and not scalable.

While AB758 instructs that there is a process to determine a path forward, we are concerned that to date, the Energy Commission has been executing on a specific vision for how they intend to implement AB758.

This current vision starts with the concept of a HERS rating, a system that is essentially "code for existing buildings" meaning it relates a home to a code compliant version of the same home. With the notion that we can create a system where an Energy Commission tool will provide a miles-per-gallon (MPG) style rating, we set up the questionable expectation that it will also produce an investment quality prediction of savings that will drive decisions and rebates. This notion is reinforced by the plan to require these ratings at various points such as time of sale, remodel, or perhaps just based on a schedule. In the future, as we hit Phase III of AB758, there will be some sort of regulatory requirement that will compel action, like code.

This goal of a one-size-fits-all system has been problematic from the start; however, after three years of using the HERS whole-house program in the field, we have some data. It turns out that there are a few key issues (inaccuracy of modeled savings vs. actual energy use savings, and cost are the most crucial).

First, there have been substantial issues related to accuracy of the HERS whole-house rating model. One study funded by an Energy Commission PIER grant showed that when you compare predicted to actual savings in Energy Upgrade California based on EnergyPro 5 and the HERS system, it showed that the model was over-predicting savings by 50 percent (a 30 percent predicted savings, delivers an average of 20 percent), and that 78 percent of homeowner are not achieving the savings predicted.

If we use a regulatory hammer to force California homeowners to first, spend $5 billion in just getting energy ratings (10M homes X $500 per rating), and then require them to make investments that statistically do not have expected paybacks, we are in essence turning energy efficiency into a tax, and we believe while there may be regulatory authority to implement this plan, there is likely not political capital to see it through.

Here is an example of what this approach will mean to potentially millions of California homeowners. As we depart from early adopters, we are going to move to a market where we are compelling millions of California homeowners to invest in energy efficiency. As we get deeper into the market, we will see an increase in the number of homeowner who are underwater on their mortgages, in the low-to-mid income brackets, and are laggards in terms of their interest. In the current model, we are going to be compelling these folks to make investments and we know in advance that even in best case scenarios there will be hundreds of thousands, if not millions, of families who see their net cost of energy increase — which for some low-to-mid income household will prove to catastrophic in this economy.

We simply do not have enough money to continue subsidizing energy efficiency at anywhere near the level we have over the last few years, and even with these huge subsidies we have only achieved perhaps 5 percent of our goals.

We need a different vision forward.

What may be appropriate for the new residential construction market may not necessarily have to be appropriate in the existing residential retrofit market no matter how much we want it to. These markets are very different and the motivations to voluntarily act and then regulate in new construction do not translate into the existing homes market. Unfortunately, in this case, one size does not fit all.

The Scoping Report does not appear to comprehensively address the appropriateness of HERS whole-house ratings from an objective perspective. We recommend that the Energy Commission re-evaluate this asset rating approach and determine its "appropriateness," including its efficacy and reliability, to support the goals of AB758 as directed by AB758. If it conducted such an objective evaluation, the Energy Commission may find, as we have, that the accuracy problems inherent in the asset rating approach make it a poor tool to support the program's market transformation goals (particularly with regard to the existing homes market), which depend so heavily on building consumer confidence.

Examining the appropriateness of an asset rating should necessarily involve, by default, an examination of alternative rating approaches, such as operational ratings to meet the goals of AB758.

Regardless of what direction the Energy Commission decides to pursue regarding the role of its HERS program in the marketplace via Public Resources Code Section 25942, the home performance contractor community sees no direct role for home ratings in the home retrofit process itself and requests that the Energy Commission recognize that treating any aspect of an energy upgrade project as a trigger to perform a rating is not appropriate to support achieving the magnitude of upgrade projects envisioned by the program. Instead we advise to keep the home energy "rating" process separate from the energy upgrade sales and retrofit process.[5]

Scoping Report: "In recent years, building rating systems have begun to proliferate throughout the United States and the world mostly as voluntary tools. However, policy makers increasingly view them as a way to label and promote more efficient buildings. This has been driven by the concept that ratings help create property value for energy efficiency and can be useful as a sales tool or for motivating competition, leading to actions to improve efficiency."[6]

The CBPCA and Efficiency First California would ask that the Energy Commission use caution in adopting a regulatory approach to building energy ratings in the existing residential market and agree with

[5] See Appendix A: *Home Performance Contractors Desired Outcomes,* Efficiency First California/CBPCA, September 2012, Policy Environment (#2, A-C).

[6] *Comprehensive Energy Efficiency Program for Existing Buildings,* California Energy Commission Staff Report, August 2012, CEC-400-2012-015, page 49.

the conclusions of the Lawrence Berkeley National Laboratory Clean Energy Program Policy Brief entitled "The Value of Energy Performance and Green Attributes in Buildings,"[7] which states:

> "These studies suggest that homebuyers and commercial building owners may pay more for a building that they know is rated as energy efficient. However, given the limited evidence, more studies are clearly needed to build a larger body of support for the market value of building labels, particularly in regard to the value of "green" labels that tout benefits in addition to the financial advantages of energy efficiency…
>
> "… Hedonic pricing models and appraiser valuations have been used for many years by the real estate market to determine home prices and the value of properties' components. Given larger datasets and data points as the number of labeled or rated homes grows, and applying these methods, future studies may well be able to quantify the value of "green" and energy efficiency upgrades with increasingly reliable results."

In addition we are very concerned that the inaccuracy of the modeled asset ratings vs. the actual energy savings may cause consumers to distrust home performance and the value of energy efficient retrofits in general. "Both the California and UK rating systems are based on a faulty notion that relative scores are more important than accuracy [of energy savings]," according to Matt Golden, in his July 30, 2012, blog "What can Energy Efficiency Ratings learn from the MPG?"[8]

Also, we believe that there has been much data collected over the past two years during the ARRA-funded programs that should be made publically available, and should be analyzed to inform the AB758 Draft Action Plan. We believe that analysis of this data will back our assertion that asset ratings are the wrong approach for California.

Trigger Events for Home Ratings

Scoping Report: "Completion of post upgrade ratings could also be appropriate for upgrade projects that are recruited for participation in ongoing whole-house incentives programs… One way to address the potential problem of increased touches would be for the whole-house incentive program to build the rating into the program's QA process by avoiding QA visits by relying on the rating instead. Under this approach, the program would have to be convinced of the reliability of the rating for QA purposes."[9]

We recommend against the proposal to turn the rating process into a Quality Assurance service. To ensure effective projects, QA needs to be focused solely on maintaining and improving industry implementation of established standards and best practices, and providing as-needed mentoring for home performance professionals to constantly improve their skills and performance in what is a very complex profession.

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[7] *The Value of Energy Performance and Green Attributes in Buildings: A Review of Existing Literature and Recommendations for Future Research,* Lawrence Berkeley National Laboratory, Clean Energy Program Policy Brief, September 7, 2011.
[8] Efficiency.org, July 30, 2012, blog: http://www.efficiency.org/1/archives/07-2012/1.html
[9] *Comprehensive Energy Efficiency Program for Existing Buildings,* California Energy Commission Staff Report, August 2012, CEC-400-2012-015, page 61.

Asking the QA provider, upon whom the credibility and integrity of the industry depends, to perform two roles dilutes his/her attention; asking a HERS rater to perform two roles would require they also be fully qualified and experienced enough to provide QA services.

Energy Efficiency Upgrade Programs

Financing Programs

Scoping Report: "The CHF MIST I finance program provided below-market interest rates (0-3 percent), [and]15-year term loans to moderate-income single-family homeowners in CHF member and associate member counties and cities.…Many things were learned from this successful ARRA program.…A whole-house energy efficiency financing program with generous terms meets a clear market need."[10]

We agree affordable, and accessible, financing is a key tool for growing homeowner participation in the current economy. And an affordable program such as CHF does drive market demand, though we recognize that the government subsidized program is neither scalable nor sustainable. More financing options that provide affordable interest rates and/or accessible underwriting terms are needed to serve the wide variety of customer situations and needs. Access to a variety of financing tools (e.g., leasing tools, on-bill and repayment options, loan-loss reserves, Property Assessed Clean Energy [PACE], and Energy Efficient Mortgages) equips contractors to provide solutions for a range of financing needs. We also see a need for an online financing clearinghouse, so contractors have the tools "at the kitchen table" to complete project planning with their clients.[11]

Residential Whole House Upgrade Programs

In describing the Retrofit Bay Area program, the Scoping Report states: "The program concluded that the complicated contractor credential requirements, lack of contractor knowledge of the marketplace and the benefits of home energy upgrades, and lack of homeowner trust in contractors to complete upgrades created obstacles in completing projects through the program.…Lack of project data from the utility caused programmatic problems with issuing regional and county matching rebates."[12]

This description captures some but not all of the elements of "program friction" (i.e., complications to project implementation caused by program processes) experienced by Participating Contractors. Program friction points not mentioned here include burdensome and inconsistent rebate and QA processes that delay projects and confuse customers. Creating a "zero program friction" environment by resolving program inefficiencies would allow current Energy Upgrade Participating Contractors to complete significantly more energy upgrade projects, and in turn attract more contractors to enter the program, which would lead to projects being done faster and more economically and thus, help scale and transform the industry. We must work toward the elimination of any unnecessary mandated or duplicative step or process that adds time or cost to the homeowner and contractor interaction. A simple sales,

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[10] *Comprehensive Energy Efficiency Program for Existing Buildings*, California Energy Commission Staff Report, August 2012, CEC-400-2012-015, page 102.

[11] See Appendix A: *Home Performance Contractors Desired Outcomes*, Efficiency First California/CBPCA, September 2012. Consumer Financing (#17 through #22).

[12] *Comprehensive Energy Efficiency Program for Existing Buildings*, California Energy Commission Staff Report, August 2012, CEC-400-2012-015, page 106.

implementation, and rebate process with streamlined Quality Assurance while meeting statewide policy goals and ensuring ratepayer dollars are spent wisely is possible can be accomplished through collaboration with Participating Contractors as program course adjustments are made.[13]

Mandatory Energy Upgrade Programs

Scoping Report: "AB758 gives the Energy Commission the authority to develop regulations to achieve the legislative goals. This could include developing mandatory rating and labeling requirements and potentially include mandatory energy upgrades as a component of the program. For any mandatory program to be successful in achieving the objectives, there needs to be sufficient market infrastructure developed to support program implementation. The goal of the Energy Commission is to first establish and refine the appropriate tools and other supportive market infrastructure and attempt to accomplish program objectives through voluntary approaches before considering mandatory programs."[14]

We agree that voluntary participation is the best route to significant customer participation. That is why it is vitally important that government programs collaborate with the building performance industry to ensure customer satisfaction, resolve program barriers (e.g., confusing rebate rules, trying to integrate ratings into energy upgrade projects, multiple QA touches, and delayed rebates) and recognize and reward high quality, top performing contractors for their leadership, early investments in the industry and risk-taking deep energy reductions as examples to encourage broader industry growth.

Performance-Based Incentives

Scoping Report: "A key strategy toward deeper retrofits is to develop "performance-based" incentive programs. Incentive strategies that are focused on promoting one type of technology over another provide a rebate to offset the incremental cost of the equipment, or the increased cost of the premium efficiency choice over the conventional technology choice. Performance-based incentive programs reward the customer based on the improvement in efficiency over the baseline. This approach encourages customers to implement as much efficiency as is feasible and cost effective, helping to promote deeper retrofits. However, initial attempts at delivering a performance-based incentive program, particularly in the residential sector, are far from perfect. The modeling approach currently used, as well as the existing administrative process, can be burdensome and prohibitive for contractors. While this does not indicate that the performance-based approach should be abandoned, it does caution program implementers to carefully consider underlying assumptions in program design and to learn from existing efforts. It is expected that the contractor community will be a key stakeholder in discussions to resolve these issues."[15]

To achieve a scalable market, rebate strategy and rebate process must be simplified to achieve zero program friction. It is time to revisit early assumptions around energy modeling, measuring, and administering rebates. It should be understood that the energy modeling currently required by the Energy Upgrade California program is not used by the contractors to plan or execute their work — it is solely used to determine rebate amounts, which creates inefficiencies and added contractor costs. The modeling

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[13] See Appendix A: *Home Performance Contractors Desired Outcomes,* Efficiency First California/CBPCA, September 2012, Program Design and Implementation (#3 through #4).

[14] *Comprehensive Energy Efficiency Program for Existing Buildings,* California Energy Commission Staff Report, August 2012, CEC-400-2012-015, page 111.

[15] *Comprehensive Energy Efficiency Program for Existing Buildings,* California Energy Commission Staff Report, August 2012, CEC-400-2012-015, page 114–115.

process for contractors and program managers as currently implemented is hugely expensive and creates tremendous program friction for all participants. We encourage collaboration with the building performance industry to seek a rebate process that is simpler and less expensive.. Such a collaboration would result in fresh approaches to incentive design.

Balance the Need for Quality Assurance/Quality Control with the Need for a Streamlined Program

Scoping Report: "QA/QC procedures are an important part of a program. These policies mitigate against errors in program delivery, helping to ensure a quality project is installed that delivers on customer expectations and administrator requirements. However, it is important to establish a streamlined QA/QC process that is effective, yet quick and easy for the building owner and the contractor. Existing QA/QC procedures can cause multiple visits to one property, each involving time from the property owner to provide access to the building. It would be ideal if the QA/QC process were streamlined to eliminate multiple steps, visits, and players for the building owner. There is value in providing verification to the building owner that the project was completed to standard, but ideally this effort will be accomplished with minimal disruption to the building owner. The goal should be to have a properly trained and competent workforce to avoid callbacks and have only minimal disruptions to the building owner. For example, in the residential sector, a QA verifier and a HERS Rater could coordinate the visit to a home if the retrofit project also triggers Title 24, Part 6 requirements."[16]

Contractor's Perspective on QA/QC

Quality work is essential to building robust consumer demand and confidence and ensuring industry best practices through implementation of consistent and effective standards. Ensuring quality begins with individual company Quality Control (QC) practices that ensure that company meets its client's goals as well as industry and program requirements; QC practices are part of a company's quality systems management and ensure the project produces the expected results.

Quality Assurance (QA) is a third-party inspection conducted to ensure projects comply with programmatic or code requirements (i.e., contractors are doing the right things the right way) and is essential for "providing confidence that quality requirements will be fulfilled," according to the International Standards Organization 9000 quality management standards. QA supports consumer confidence in program services and is a vehicle for contractor mentoring/education.

The current Energy Upgrade California™ QA program functions more like a QC process inserting third-party oversight throughout project implementation (from QA test-in to one or more QA test-out visits if a HERS whole-house rating is included). In some IOU service territories, 100 percent pre-/post-testing QA protocols have resulted in slow consumer uptake, hesitance among potential new market entrants concerned about maintaining a profitable business model, and dramatically slow pacing of job completion (potentially imposing as many as 11 home visits per project).[17] This approach underestimates the professional caliber of BPI-credentialed home performance contractors, creates a time and cost burden for

[16] *Comprehensive Energy Efficiency Program for Existing Buildings*, California Energy Commission Staff Report, August 2012, CEC-400-2012-015, page 116.

[17] See Appendix B: *Energy Upgrade California™ Contractor's Workflow*, Efficiency First California/CBPCA, September 2012.

the homeowner and contractor, and has suffered from inconsistent and arbitrary protocol implementation and inspector quality across programs.

The existing QA process for Energy Upgrade California is complicated and costly for customers and contractors and the CPUC agreed when it adopted its 2013−2014 Energy Efficiency Guidance Decision (D. 12-05-015) in May 2012 and directed IOUs to streamline and make consistent statewide the Energy Upgrade California job application/approval process. In this Decision, the CPUC stated that:

> …we believe that streamlining Energy Upgrade California program application and job approval procedures more generally is essential to developing contractor support for the program. We direct IOUs to include in their 2013−2014 Energy Upgrade California proposals a "Fast Track" Energy Upgrade California job approval protocol based on the HVAC Energy Replacement Protocol. This proposal should apply more generally to the Energy Upgrade California program. The intent of such a "Fast Track" Energy Upgrade California job approval protocol is to accelerate Energy Upgrade California job approvals for experienced Energy Upgrade California contractors with strong quality assurance records.[18]

We recommend an open market system for QA services based on a recognized industry standard, such as the BPI Quality Assurance Program; this model has enjoyed over a decade of success with the New York State Energy Research and Development Authority (NYSERDA) providing a 5 percent inspection rate and "QA on the QA" program that to-date has yet to identity a single significant issue.

This "open market system based on recognized industry standards" would level the playing field across all State programs for all contractors, improve statewide consistency and mobility for contractors working in multiple jurisdictions, and reduce overall program administration costs. Such an open system would need clearly documented protocols and standards so that everyone (inspectors and contractors alike) is "on the same page" and can effectively explain the process and the benefits to the customer. Contractors could also be rewarded for quality performance through a tiered QA sampling system that accommodates various levels of contractor skill and experience, and uses data collection showing pre-/post-conditions to flag poor performers in need of support or sanction. Conducting QA verification at the same time as contractor test-out, so both the QA provider and contractor are present, would improvement efficiencies and communication on QA issues, reduce the impact on the client, and demonstrate positive program collaboration. In addition, the integration of field mentoring during QA verification would help build contractor confidence, establish clear examples of what parameters are being measured in the field, enhance industry best practices, and support new entrants into the market.[19] For example, requiring test-out mentoring on the first three jobs of all Advanced Package contractors would create a QA process that is supportive and educational versus punitive. Contractors will be eager to participate because this process will validate their results.

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[18] *Decision Providing Guidance on 2013−2014 Energy Efficiency Portfolios and 2012 Marketing, Education, and Outreach*, California Public Utilities Commission, Rulemaking 09-11-014, Decision 12-05-015, May 10, 2012

[19] See Appendix A: *Home Performance Contractors Desired Outcomes*, Efficiency First California/CBPCA, September 2012, Quality Assurance and Quality Control (#27 through #34).

We are fortunate that three potential alternatives to the current QA situation have been identified by industry standards leader BPI based on the successful NYDSERDA program that provides dual protections for consumers and contractors.

Alternative 1: "QA on the QA" Program

The first alternative would provide training for program QA providers and provide "QA on the QA" supervisors certified in nationally recognized industry standards, such as BPI's qualified QA provider network, for both office and on-site inspections. Using QA providers trained in national standards to monitor and mentor program QA staff would ensure a consistent QA reporting mechanism for consistency and quality data sharing for the entire statewide program, as well as technical support on standards implementation and interpretation and dispute resolution assistance in case of QA provider and contractor disagreement. This would ensure consistent QA for all Energy Upgrade California Participating Contractors, and improve the cost-effectiveness of the statewide program QA process. No matter what entity provides the service, a statewide "QA on the QA" program based on recognized national standards is essential so there is a clear and consistent message from QA providers that helps contractors deliver the full measure of energy performance and health and safety benefits.

Alternative 2: Contractor Service

The second alternative would use BPI's qualified QA providers network to provide a truly neutral, third-party QA service directly to all Energy Upgrade California Participating Contractors at agreed upon and predictable inspection rates, and using BPI QA protocols and BPI QA reporting process and appropriate data sharing schemes through the adoption of a BPI Accreditation requirement

Alternative 3: Program Service

The third alternative would provide the Energy Commission, utilities, and Participating Contractors with consistent, qualified statewide QA services via a nationally recognized standards provider, such as the BPI QA provider network, with no additional cost burden on the contractors, and likely substantially reduced cost to the programs.

The Energy Commission recognizes the importance of reducing administrative obstacles and burdens on contractors. The alternatives outlined above are based on the BPI QA Program, which has been developed, tested, and used in other major energy efficiency programs for over a decade, and meets the cost-effectiveness requirements needed to support contractor participation.

In addition to delivering a streamlined and consistent QA process, a statewide QA program based on nationally recognized standards would be cost effectiveness as demonstrated by comparing current QA implementation costs per project to the cost of current industry QA services such as BPI accreditation QA.

We recommend considering these alternatives to ensure QA services are consistent with national standards across the state.

Workforce Development

Scoping Report: "Alignment of workforce training, standards, and certification with state policy is necessary to ensure that the workforce has the capacity, skills, and knowledge required to meet California's energy efficiency policy goals.… California leads the nation in clean energy investments, and through judiciously crafted energy efficiency policies and strategic partnerships with state and local government, education, and industry, the state can catalyze the creation of well-paying jobs for California's workers and the expansion of quality, credential-based training to ensure high standards are met for energy efficiency measures in support of AB 758."[20]

The success of the entire building efficiency program depends on qualified contractors executing high-quality jobs profitably and rapidly. Building a well-trained, effective workforce means committing to recognized industry standards, such as Building Performance Institute (BPI) Certification and Standards, in order to lay the foundation for workforce consistency, national recognition, and continuous improvement.

It is difficult to build a business in an environment of changing requirements. Therefore, it is important to actively participate in national efforts to improve standards and certifications that will create consistent best practices and clear expectations for contractors considering investing in home performance construction. Commitment to proven standards will also attract seasoned construction workers into this emerging industry.

Because ARRA-funded Energy Upgrade California workforce development programs focused primarily on Building Performance Institute (BPI) Building Analyst certification in order to qualify contractors to provide the Advanced Package service and incentive, we currently have many technically trained contractors with a narrow range of very basic skills. However, in order to build a comprehensive building performance industry equipped to grow at speed and scale to meet State energy goals, we must provide advanced training in all skills needed for success, including competence in business, sales and marketing, quality control, and installation expertise.

Moving forward, Building Science principles must remain the foundation for the next phase of workforce development; acquiring the skills required for the hands-on application of these principals.[21] As the marketplace becomes more aware of the benefits of energy savings, safety, and comfort provided through the application of home performance best practices, there is a growing demand for an ever larger pool of "highly skilled" contractors and, just as critical, readily available and equally highly-skilled technical workers. This market demand is already defining the need for existing and new types of technical, hands-on training. In order to maintain this momentum, contractors and their crews must have the essential skills to provide services that meet the requirements of these high-performance approaches.

Marketing, sales, and business management training for home performance companies is also essential. For most contractors, moving into whole building performance is a business model shift that needs

[20] *Comprehensive Energy Efficiency Program for Existing Buildings,* California Energy Commission Staff Report, August 2012, CEC-400-2012-015, page 36.

[21] See Appendix A: *Home Performance Contractors Desired Outcomes,* Efficiency First California/CBPCA, September 2012, Workforce Development (#5 through #11).

planning. Selling whole building performance also requires specialized communication skills that are not always held by technical personnel such as building analysts or energy auditors, although some do acquire those skills and become effective sales people.

To build a robust industry, workforce development must be readily accessible, affordable, and more broadly defined in terms of technical training and mentoring at the auditor, crew leader, installation, and internal quality control levels, as well as the Quality Assurance inspector level. And as new contractors enter the home performance industry, it will be increasingly important to leverage other existing specialty certifications, such as HVAC installer certifications (e.g., North American Technician Excellence), that are not covered — but are recognized — by BPI for accreditation purposes.

Growing companies will need pre-qualified, credible, new-hire candidates from workforce development programs, community colleges, and trade tech systems to fill a range of positions including field crew jobs. Numerous post-secondary schools throughout California are ready, willing, and eager to prepare new-hire candidates, but need to collaborate with industry partners to ensure they provide training to address single family and multifamily properties as well as low-income weatherization and building performance professions. Growing companies will also need incentives and/or financing to underwrite contractor investments in equipment.

Data Needs for Decision Support

Scoping Report: "The market succeeds when data is available not only to inform program design and evaluation efforts, but also to enable contractors, investors, entrepreneurs, and other essential market actors in their business decisions."[22] "There is tremendous value in centralizing all energy performance data into one place." "All parts of the market should have access to it."[23]

We agree that data collection should be centralized and accessible to multiple stakeholders, and we support the development and adoption of national standards for data collection, calibration, and data transfer protocols.[24] There are emerging initiatives that hold promise to utilize smart meter data to inform decision making by homeowners, business owners and contractors. We believe the path towards utilizing operational data (instead of focusing our limited resources on asset data accumulation) is the most cost effective approach, and is much more likely to lead to the rapid innovation from the private sector that we need to reach our desired outcomes.

As stated above, we believe that there has been much data collected over the past two years during the ARRA funded programs that should be made publically available.

[22] *Comprehensive Energy Efficiency Program for Existing Buildings*, California Energy Commission Staff Report, August 2012, CEC-400-2012-015, page xiv.
[23] *Comprehensive Energy Efficiency Program for Existing Buildings*, California Energy Commission Staff Report, August 2012, CEC-400-2012-015, page 141.
[24] See Appendix A: *Home Performance Contractors Desired Outcomes*, Efficiency First California/CBPCA, September 2012, Administration and Reporting (#25).

Reaching Property Owners and Public Awareness: Marketing, Education, and Outreach

Urgent and Visible Message

Scoping Report: "Marketing, education, and outreach are three complimentary strategies that collectively comprise the public-facing aspect of a program.… A marketing, education, and outreach program is intended to motivate consumers to take a specific action.… Advertising is used to broadcast messages through traditional media channels – television and radio ads, print ads, and billboards. Outreach compliments marketing activities by delivering the same message through on the ground messengers, such as building industry professionals, program staff, local government, business and community leaders, and non-profit organizations. Education overlaps with outreach, and is designed to inform consumers about the 'why' to take action."[25]

The vast majority of the public has not yet heard of Energy Upgrade California, or that buildings are one of the largest contributors to global warming in the U.S. and that there is a solution (whole-house upgrade) that also provides multiple other economic and life-enhancing benefits. Building performance professionals understand and embrace their role in both building an industry and serving the public good through effective building upgrades that reduce greenhouse gas emissions.

The industry recommends the market transformation effort convey a sense of urgency about the environmental and economic benefits of taking action as well as the environmental and economic consequences of inaction. Chief among those engaging this important community dialogue ,we recommend enlisting our State's leaders including elected officials, government officials, utility representatives, and other high-profile and well-respected spokes people from throughout the state, regional, and local communities.[26]

Scoping Report: "Other critical partners and messengers are building industry professionals, other energy professionals, and facility managers, who often are the first point of contact with a property owner or decision maker. … Provide resources for existing outreach channels to enable their ability to spread the message on behalf of the program, including cooperative marketing resources for building industry professionals.[27] … Foster innovation at the local and regional level to support new or emerging marketing and outreach models, such as … the Cooperative Marketing approach piloted in four regions (Bay Area, Sacramento, Los Angeles, and San Diego).… The more successful programs encouraged a high level of innovation by participating contractors."[28]

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[25] *Comprehensive Energy Efficiency Program for Existing Buildings,* California Energy Commission Staff Report, August 2012, CEC-400-2012-015, page 131.

[26] See Appendix A: *Home Performance Contractors Desired Outcomes,* Efficiency First California/CBPCA, September 2012, Public Education and Marketing (#12, #13, #14, #16).

[27] *Comprehensive Energy Efficiency Program for Existing Buildings,* California Energy Commission Staff Report, August 2012, CEC-400-2012-015, page 138.

[28] *Comprehensive Energy Efficiency Program for Existing Buildings,* California Energy Commission Staff Report, August 2012, CEC-400-2012-015, page 139.

Most home performance professionals are experienced lead generators who know how to find customers and turn interest into action once they are at the kitchen table. Coop marketing programs leverage both State and contractor resources for a double benefit, and allow contractors ─ who know their audience and market ─ to focus those dollars on high-yield lead generation with a greater capacity to produce completed projects. We highly support the use of coop marketing and recommend a significant portion of MEO resources be committed to coop marketing.[29] It is important that contractors are included and involved at higher levels of discussion and authority in order to more quickly illuminate implementation barriers as well as provide practical suggestions for flexibility and speed improvements to the process.[30]

[29] See Appendix A: *Home Performance Contractors Desired Outcomes*, Efficiency First California/CBPCA, September 2012, Public Education and Marketing (#15).

[30] See Appendix A: *Home Performance Contractors Desired Outcomes*, Efficiency First California/CBPCA, September 2012, Policy Environment (#1, #1-A).

Appendix D:
National Home Performance Council Report — Bringing on the Boom and Beating the Bust

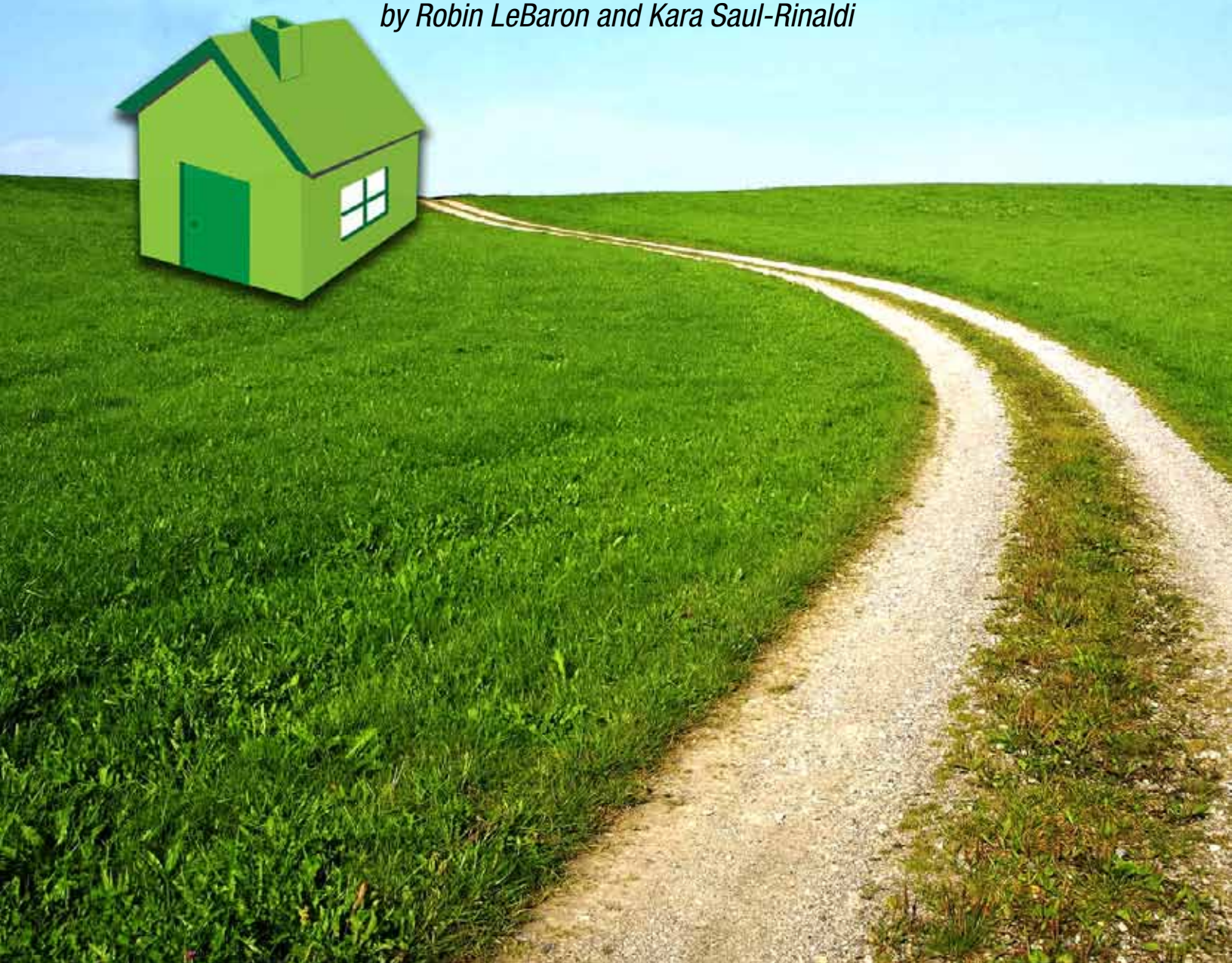
National Home Performance Council

April 2013

BRINGING ON THE BOOM AND BEATING THE BUST

A Framework for Developing a Roadmap to a Successful Home Performance Industry

by Robin LeBaron and Kara Saul-Rinaldi



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Executive Summary

The home performance industry needs a roadmap to achieve profitability and scale. The need for a plan is widely recognized among industry experts, and a number of recent meetings and publications have made important contributions to proposing solutions to the challenges that the industry faces. However, these efforts have not yet resulted in a clear, broadly accepted vision of the tasks that need to be undertaken to get the industry to scale.

A home performance industry roadmap should accomplish three broad tasks:

- Identify and prioritize the key challenges that prevent the home performance industry from achieving scale and profitability;
- Describe strategies for addressing each of these key challenges; and,
- Outline a process for implementing the strategies in a coordinated fashion that allows for rapid testing and sharing of results.

A roadmap should be grounded in the recognition that there are two very different types of markets for whole-house energy efficiency upgrades: 1) consumer markets that value energy savings, comfort, and other benefits to the homeowner; and, 2) "resource" markets that value energy efficiency for its contribution to meeting capacity, energy, carbon reduction, and possibly other goals.

This paper does not provide such a comprehensive or definitive roadmap. Instead, its goals are to promote public discussion and debate about what should be in a roadmap and provide a framework for that debate to occur. Accordingly, this paper undertakes two projects: first, to identify a range of stakeholder-identified challenges and solutions that could be considered for inclusion in an industry roadmap, and second, to outline a process by which an industry roadmap could be developed and implemented.

It should be noted that these proposals are explicitly national in scope. Although there is an important role for local and regional creativity and experimentation, at this point in the industry's development, it is important to recognize that the most significant problems that the industry faces are experienced across the nation, and that while different regions may experiment with different strategies to address these challenges, national communication and coordination regarding these efforts is crucial. Further, the lack of standardization has become a significant barrier to industry growth in its own right, and as a result, a successful roadmap needs a national perspective to support the appropriate level of industry-wide uniformity.

The Consumer Market for Whole-house Upgrades

The most significant challenge that the home performance industry faces in developing a consumer market for whole-house upgrades is the lack of a compelling value proposition for homeowners. This is not to suggest that whole-house upgrades have no value to homeowners; on the contrary, they offer a wide range of sometimes very significant benefits. But for many homeowners, these benefits are not sufficient to offset the costs, both monetary and other, involved in upgrading a home. The industry's first priority must be to enhance the value proposition, by increasing the benefits to homeowners and/or decreasing the costs.

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This paper makes several recommendations for improving the value proposition:

- A significant and well-designed (ideally national) incentive, either in the form of a rebate or tax credit;
- A coherent strategy focused on a national "recognition system" for incorporating energy efficiency into the real estate value chain;
- Development of better and more accurate systems for measuring energy savings;
- Development of strategies to reduce homeowner costs by tapping reactive markets and staging upgrades over time; and
- Reduction of homeowner risk through rigorous quality assurance that also assists contractors in differentiating themselves from competitors.

This paper also makes a number of other recommendations for supporting the development of a robust consumer market for whole-house upgrades related to challenges other than the consumer value proposition. These include:

- Greater standardization of program requirements and operations to enhance contractor profitability;
- Reduction in the costs of data collection and transfer;
- Development of a national marketing and branding strategy developed by or in conjunction with the private sector; and,
- Development of appropriate financing programs, particularly on-bill repayment mechanisms and consumer products that can be originated rapidly and easily.

Markets for Energy Efficiency As a Resource

Realizing the full potential of resource markets for energy savings or "negawatts" – including capacity, energy and carbon markets, and possibly other markets as well – is a challenging proposition and a longer-term project for the home performance industry. In accessing these markets, the industry faces challenges that include poorly designed cost-effectiveness tests, lack of appropriate financial incentives for utilities, the pressure of rate increases as efficiency programs gain traction, the lack of adequate consumption data, an array of technical challenges and, most generally, the absence of functioning markets for energy efficiency as a resource in large areas of the U.S.

The home performance industry does not have the capacity to address all of these challenges. However, there are a number of steps that the industry can take now to capitalize on existing market opportunities and lay the groundwork for creating new ones. These include:

- Research best practices in cost-effectiveness testing and advocacy for best practices in testing;
- Research rate impacts resulting from the growth of energy efficiency programs and ways to mitigate these impacts on vulnerable ratepayers;
- Advocate for performance obligations;
- Advocate for the redesign of utility compensation to incentivize energy efficiency;
- Improved access to utility consumption data, and streamlined data collection and transfer protocols;
- Share knowledge regarding programs' or other intermediaries' capacity to access existing

resource markets; and,
- Advocate for the expansion of capacity, carbon, and other resource markets to new geographic areas.

Process for Developing a Roadmap

As discussed above, this paper does not claim to be a definitive roadmap, but rather is intended to facilitate a broad stakeholder discussion towards creating one. This discussion would include analysis of key challenges and identification of solutions. It would also include prioritization of solutions, so that the industry could devote resources to addressing the most immediate challenges first while setting the stage for addressing the broader solutions in parallel.

Once action items (i.e. the "solutions") have been identified and prioritized, the roadmap will need to undertake the following:

- Assign responsibility for carrying out action items to specific organizations;
- Inventory the resources available to implement action items; and,
- Ensure that the inventoried resources are matched with responsible organizations so necessary work can actually be carried out.

One organization (or a small group of organizations) should be tasked with providing overall coordination of implementation efforts to ensure that results are more – not less –than the sum of their parts. A clear plan for sharing progress and findings should be an explicit part of the implementation strategy.

Finally, the implementation of each strategy should include a clearly defined process for testing assumptions, including a way to ensure that implementers have some latitude to fail without repercussions. Approaches that are demonstrated to be unsuccessful should be rapidly modified or discontinued.

Introduction

The home performance industry needs a roadmap that will guide it from promise to profitability and scale. Twelve years after the first Home Performance with ENERGY STAR® program was launched in New York State, home performance programs and contractors have demonstrated that they can significantly reduce the energy consumption of existing residential buildings, and that consumers - under the right conditions - are willing to pay for energy efficiency upgrades. Yet the industry is still very small, completing approximately 60,000 upgrades the U.S. each year. Although growth has been rapid during the past few years, much of that expansion has been due largely to the influx of ARRA funds, and observers are concerned that growth may slow as these funds are exhausted, and as the price of natural gas continues to fall.

Most participants in the home performance industry – contractors, program implementers, sponsors, and others – agree on three fundamental issues. First, the home performance industry should seek both to enable contractors to make attractive profits, and to "grow to scale" – a term used here to mean growth to the point that the industry is upgrading at least 2% of the existing U.S. housing stock each year.[1] Second, markets are key to achieving these goals; that is, profitability and rapid, large-scale growth are predicated on large numbers of buyers willing to pay prices sufficient to induce contractors to increase the energy efficiency of homes. And third, that current approaches, while valuable, are not sufficient in their current form to achieve scale in the foreseeable future.

Despite general agreement on these fundamental issues, there is no industry-wide consensus on how profitability and growth to scale should be achieved. In the past few years, several important proposals for moving the industry forward have been advanced, including RAP's *Residential Efficiency Retrofits* (2011), the Energy Futures Group's recent report to the BRIM Collaborative (2013), and DOE's *Program Report* on the Home Performance with ENERGY STAR® program (2013). The Lawrence Berkeley National Laboratory's well-known study, *Driving Demand* (2011), might also be considered in this context, although it is explicitly more restricted in scope than the other documents. Each of these publications makes many significant contributions to thinking through the challenge of how to achieve scale, but each, as discussed in the concluding section of the report, leaves several crucial issues unaddressed, and does not provide sufficient detail as to who will assume responsibility for which specific tasks.

This paper seeks to build on these papers' recommendations by incorporating them into a somewhat different analytical framework. This approach is based on the premise that a roadmap needs to

[1] Significant expansion of the home performance industry would generate many social and individual benefits, including the energy savings realized by homeowners and the replacement of higher-cost supply side resources with energy efficiency measures. The two most significant benefits are new job and profit opportunities in the home contracting industry, which has been severely affected by the post-2007 real estate crash, and reduction in the nation's carbon footprint. The choice of 2% of the nation's housing stock is represents the higher boundary of market penetration currently being achieved in areas with the most whole-house upgrade activity, and would allow meaningful reductions to be made to the energy consumption (and carbon emissions) of the U.S. building stock over several decades. Other documents have suggested more ambitious targets; Neme et al., for example, suggests that the whole-house upgrade industry in the U.S. needs to achieve a 5% market penetration to achieve the carbon reductions necessary to meet climate goals (Neme et al. 2020, 3).

accomplish three tasks:

1. Identify and define the key challenges that the industry faces;
2. Elaborate one or more strategies explicitly designed to address and surmount each of these challenges; and,
3. Describe a comprehensive process for implementing and testing strategies.

The document identifies a number of solutions to key challenges that have emerged in discussions with stakeholders. More importantly, it proposes a framework for prioritizing projects and allocating responsibility for undertaking them.

It should be emphasized that this document is not envisioned as a roadmap itself. It is intended to encourage discussion and disagreement, both by proposing issues that have been raised by stakeholders as solutions to the industry's issues and, more importantly, to provide a framework for further conversations to take place in the most productive fashion possible by focusing on problems, solutions, priorities and responsibilities.

Before beginning this discussion, however, three assumptions that underpin the paper should be noted.

Two Different Markets for Whole-House Upgrades

As noted above, the home performance industry works to advance whole-house upgrades: a seemingly unitary product that in fact has two very different forms of value. For homeowners, the whole-house upgrade provides a bundle of benefits, including utility bill savings, improved health and comfort, and enhanced home re-sale values. For utilities and ratepayers as a whole, the whole-house upgrade creates a capacity and potentially an energy resource – the "negawatt" – that can serve utilities as an alternative to traditional supply-side resources, and that can also serve as a resource in other markets (notably carbon markets, in areas where they exist). Because the upgrade creates these two different forms of value, there are two distinct and very different markets for whole-house upgrades: the homeowner market for a bundle of benefits, and the utility market for reduction in the energy requirements of its service territory.

The homeowner market is the most significant of these two markets; the home performance industry will not reach scale unless consumers are willing to shoulder a significant portion of the cost of upgrading their home. However, the market for efficiency as a resource has the potential to generate revenues that could be used for a range of supports that would enhance the consumer-facing market. Solving the problems of the homeowner market should be the industry's first priority, but development of the market(s) for energy efficiency as a resource should be an important second major objective.

The goal of a roadmap should be to chart a path to a situation in which robust markets for both of the "products" of a whole-house upgrades have been created. Depending on energy and carbon pricing, these markets might be "self-sustaining," or require some direct subsidies. Programmatic infrastructure might be needed at this point on an ongoing basis, but programmatic activities would be relatively limited to setting the ground rules that allow the market to function through QA and other related

activities. Subsidies and programs, in other words, should be seen as means to achieving flourishing markets, not as ends in themselves, and should be evaluated on the basis that they contribute to market creation.

National Scope

It should be noted that these proposals are explicitly *national* in scope. Although there is an important role for local and regional creativity and experimentation, at this point in the industry's development, it is important to recognize that the most significant problems that the industry faces are national in scope, and that while different regions may experiment with different strategies to address these challenges, national communication and coordination regarding these efforts is crucial. Further, the lack of standardization has become a significant barrier to industry growth in its own right, and as a result, a successful roadmap needs a national perspective to support the appropriate level of industry-wide uniformity.

Markets and Programs

As noted at the outset, this discussion is premised on the assumption that the only way to grow the home performance industry to profitability and scale is by developing flourishing markets for whole-house upgrades. However, it also assumes that programs – the programmatic infrastructure that currently issues rebates, trains contractors, implements QA, etc. – will remain important to the home performance industry, and will assume the primary responsibility for many (although not all) of the action items recommended.

Some home performance practitioners have recently suggested that programs are getting in the way of market development, that programs have little capacity to develop markets, and that in a well-functioning market there would be little to no need for programs to perform more than a modest regulatory role designed to ensure fair business practices.

This line of argument makes two important points: first, that programs should not be responsible for all the activities they are currently undertaking, and second, that the final goal should be markets characterized by relatively modest programmatic involvement. However, the suggestion that programs should not by definition play a role in market development ignores the extent to which public and non-profit action has been crucial in the establishment of a broad range of other types of markets (including, for example, most renewable energy sources). Given current low – and falling – energy prices, a market for home performance upgrades is unlikely to emerge soon, if at all, without programmatic support. It also assumes that the home performance market can exist without oversight or market distortion, which is not the case for any energy market. Any industry that raises health and safety concerns requires oversight. And every American energy resource enjoys some level of subsidy, which necessitates at least some level of oversight to prevent fraud and abuse. But perhaps most importantly, while skepticism of government involvement in emerging markets has been on the rise, many citizens still see the government as an impartial third party that can provide guidance and support on complicated issues that have the potential to benefit society as a whole.

That said, there are roles that programs may not be well-suited to play. Some industry participants

have questioned the extent to which programs should be conducting energy assessments, influencing contractor selection, and/or marketing and generating leads example. Some of these roles may be best left to market actors in almost all cases; others (such as lead generation), might be appropriate programmatic activities in some contexts but not others.

The goal of a roadmap should be to chart a path to a situation in which robust markets for both of the "products" (for the consumer and energy markets) of a whole-house upgrades have been created. Depending on energy and/or carbon pricing, these markets might be "self-sustaining," or might require some direct subsidies. Programmatic infrastructure might be needed at this point on an ongoing basis, but programmatic activities would be relatively limited to setting the ground rules that allow the market to function through QA and other related activities. Subsidies and programs, in other words, should be seen as means to supporting the advancement of flourishing markets, not as ends in themselves, and should be evaluated on the basis that they contribute to the dual market creation.

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Section 1: The Consumer Market for Whole-house Upgrades

The Consumer Value Proposition: Challenges and Strategies

The single most significant challenge to the development of a strong consumer market for whole-house upgrades is the lack of consumer demand. When home performance programs were first designed, their architects believed that whole-house upgrades would be compelling to consumers in large part because the monthly amortized cost of a typical job would be more than covered by utility bill savings. Rebates, tax credits or other incentives could turn a reasonable proposition into a very attractive deal. The other benefits of an upgrade, including improved comfort and elimination of health and safety concerns, were seen as further sweetening the transaction.

In practice, however, these induce15ments, even in combination, have not been sufficient to incentivize large numbers of homeowners to upgrade their homes; under current conditions, many homeowners do not appear to find the value proposition of a home performance upgrade compelling. The multiple reasons that consumers question the value of upgrades are not always fully understood or appreciated, but are crucial for determining how to chart a path forward for the home performance industry. The most important of these include:

- Insufficient financial incentives, in the broad sense of the term;
- Hidden costs, both financial and non-financial; and,
- Risk that savings will be significantly lower, or costs significantly higher, than projected.

It should be noted that addressing the consumer value proposition is not entirely the same thing as driving demand. Discussions of driving demand frequently assume that the value proposition exists

but needs to be revealed or explained to the consumer. This section, by contrast, assumes a more fundamental problem: that a whole-house upgrade is not necessarily compelling to a large number of homeowners even when they have a full understanding of its benefits.

Challenge 1: Insufficient Financial Incentives

The projected monetary value of energy savings is typically relatively modest, particularly when considered in terms of a middle-income homeowner's budget. In 2010, homeowners spent roughly $2,000 on energy costs (EPC 2009: 7). If an upgrade results in a 30% reduction in energy consumption – a high bar – the annual savings would be about $600, or $50 a month. If the upgrade costs $7,500 after incentives, the payback period would be over twelve years – without any consideration for the time value of the homeowner's investment. If the project is financed, even with a very favorable rate, a long payback period, and incentives, the homeowner is likely to do little more than break even in terms of monthly costs. Further, savings estimates are only estimates, and in many individual cases an upgrade will result in lower savings than estimated. Rebates and other incentives can change these calculations significantly, but in some areas the rebate may need to be considerable if the customer is expected to derive a significant financial savings from the upgrade.

Solution 1.1: Enhance Incentives Through Public Policy

The most obvious way to enhance the consumer value proposition is through rebates, tax credits or other similar incentives, supplied either by some level of government or by a utility. By effectively decreasing the total monetary outlay necessary to pay for an upgrade, the rebate or incentive can improve the value proposition in a simple and compelling fashion.

Some home performance experts have argued strenuously that the industry should seek to create markets for home performance upgrades in which subsidies are unnecessary. There are two main themes in this argument: that subsidies harm contractors because they are too transitory to allow for long-term planning, and that subsidies "distort the market," which should "stand on its own two feet."

The argument that subsidies distort the market does not take into account the extent to which the market is already heavily tilted in favor of supply-side resources. Current pricing of supply-side energy sources reflects decades of significant direct and indirect public support for these sectors. Moreover, the pricing of supply-side resources never fully takes into account the price of externalities, including carbon emissions. Public incentives for energy efficiency only help to redress this inherent imbalance in the market for energy.[2]

Public subsidies could play a crucial role in supporting rapid growth of the home performance industry by reducing the competitive advantage that supply-side resources enjoy. But while incentives are important, they need to be well-designed to have maximum impact. First, they need to be sized

[2] There is also an important policy argument in favor of public support for energy efficiency. Energy efficiency is a public good, because it is not only the least expensive way to "generate" energy, but also has a number of collateral benefits, including reductions of carbon and other pollutants. Public goods should be supported by public funds – including energy resources from nuclear re-licensing to geological surveys for carbon-based fuel and the supportive tax policies. Considering the great potential of clean negawatts that can be "mined" from homes through whole-house retrofits, the home performance industry is justified in calling for increased financial incentive to consumers to upgrade their homes.

correctly so that they encourage homeowners who would not otherwise improve their homes to take action, but are not larger than necessary. Second, they should be designed to complement other strategic goals for advancing the industry; for example, through design that supports "reactive" upgrades, as discussed below, or by supporting the national standardization that enables contractors to work in different programmatic areas without having to change their operations significantly. Third, there must be adequate measurement and verification in place to ensure that public dollars are not abused.

Two bills introduced during the 112th Congress, the Cut Energy Bills at Home Act (S. 1914) and the Home Owner Managing Energy Savings (HOMES) Act, would have created a nationwide incentive for whole-house upgrades in the form of a tax credit or rebate, respectively. Both of these bills received bi-partisan introduction, however neither saw movement due to the current stagnation within tax writing committees and a general anti-spending sentiment in Congress. Passage of legislation modeled after either bill would provide crucial support for the industry and would be aligned with the aforementioned guidelines.

More research can be done to educate policymakers on the benefits of advanced incentive programs, including:

- Support research on the many public benefits that the public dollars provide: jobs, carbon savings, consumer cost savings;
- Support research on methods to determine the "right" size for an incentive in a particular market context;
- Support careful development of incentives that support the other strategies for enhancing the value proposition discussed below; and,
- Support industry standards and data access to advance measurement and facilitate reporting requirements.

Solution 1.2: Incorporate the Value of Energy Efficiency Into the Real Estate Value Chain

The second strategy for enhancing the value of whole-house upgrades involves the development of a way to accurately value energy efficient homes. In theory, an energy-efficient home should be more valuable than a similar, but less efficient counterpart, because the efficient home costs less to operate and is likely more comfortable. Demonstration of this theory, which would give homeowners reasonable certainty that energy efficiency adds to the resale value of their home, would serve as a powerful incentive to homeowners to pay for an energy efficiency upgrade.

Proving this theory, however, requires data. Lenders and appraisers, in particular, want to see empirical studies demonstrating that an efficient home can command a higher resale price than a comparable non-efficient home, or that price is correlated with relative efficiency. A handful of studies have suggested that such relationships exist, but the data required for such research is not currently available in most markets.[3]

[3] A recent study released by the Institution for Market Transformation found that new homes built to ENERGY STAR® standards default at a rate one third less than that of comparable non-efficient homes, indirectly supporting the argument that efficient homes have more value. See Quercia et al. 2013, Home Energy Efficiency and Mortgage Risks.

Photo: 123RF

One important step towards incorporating the value of energy efficiency into the real estate value chain is to ensure that lenders and appraisers use energy costs as a factor in assessing the value of a home. The Sensible Accounting to Value Energy (SAVE) Act of 2011 (S. 1737) received bi-partisan introduction in the 112th Congress and would ensure this value was recognized. Energy efficiency is often invisible and thus difficult to value in a home sales transaction. Requiring all federal lenders to consider projected energy efficiency when underwriting mortgages would provide lower rate mortgage financing for cost effective energy improvements and enable better federal mortgage underwriting while lowering utility bills for American households.

A second step is to develop and promulgate a coherent, national "recognition system" for identifying a home's energy consumption that consumers can understand and relate to. A nationally recognized and accepted recognition system would enable homeowners to understand their homes' energy consumption and provide a tool for advertising a home's efficiency at the time of resale. It would also provide the necessary data to allow study of the relationship between resale price and efficiency. At present, several such systems – notably the HERS rating, HEScore, and Energy Performance Score – are competing in the marketplace. Although limited progress can be made in the absence of a single recognition system, the current patchwork of labels and scores creates confusion in the marketplace and discourages otherwise supportive professionals in real estate-related professions from engaging with the home performance industry.[4]

The third step towards capturing the value of energy efficiency in the real estate value chain involves incorporating the information about a home's efficiency into the information systems used by the participants in the real estate transactions, including real estate agents, appraisers, and lenders. This

[4] It should be noted that although the primary value of a recognition system is to facilitate the valuation of energy efficiency in the real estate sales process, recognition systems may also support behavioral change outside of the real estate market. By providing a metric by which a homeowner can measure the impact of his or her efforts to make the home more energy efficient, a recognition system may support more upgrading activity than would take place in the absence of such a system. Similarly, a recognition system may drive upgrades as homeowners, newly equipped with a metric to compare the efficiency of their homes compared to those of their neighbors, have a competitive motivation to make their homes more energy efficient.

involves working to ensure that the Real Estate Transaction System (RETS) and local MLS databases have the capacity to capture the most relevant information about a home's efficiency, and to promote and coordinate use of the Appraisal Institute's Green and Energy Efficient Addendum. A single number (or set of numbers) denoting a home's relative efficiency would be easier to incorporate into such systems. Conversely, the current confusion in the market between competing labels and ratings makes real estate professionals hesitant to engage with the issue. Regardless of whether the goal is to capture one or several recognition systems, however, developing the capacity for the real estate profession to capture information about the value of energy efficiency will take coordinated effort and a period of several years.

The fourth step involved in capturing the value of energy efficiency in resale transactions involves isolating the "contributory value" of energy efficiency – the value it adds to the home – through empirical research. As discussed above, such research has been difficult to conduct because of the challenges involved in linking sales prices and energy efficient homes. A national label or rating system would make an important contribution to providing this data, although even if a label was in widespread use it would still be necessary to collect and analyze data. Absent a national label, the necessary research could (and should) still be undertaken, although the findings will be less broadly applicable. Findings that energy efficiency does in fact have a contributory value, even if only in certain markets, has the potential to effect a profound long-term change in the home performance industry, because only then will homeowners really be able to have confidence than an energy efficiency investment will add value to their home in the same way installation of granite countertops would.

A fifth step involves the education and training of a number of actors involved in the real estate sales process, including appraisers, lenders, home inspectors and, of course, real estate agents themselves. To the greatest extent possible, these trainings should be able to point to the empirical data demonstrating that energy efficiency has a real empirical value.

Implementation strategies:

- Develop a pathway towards acceptance of either a single national recognition system or a way in which existing systems can be presented as complementary to reduce consumer confusion.
- Develop strategies to integrate a label/rating system with the other proposals discussed in this paper (e.g., a national measurement system with an incentive system based on improvement relative to that home's baseline rather than to absolute savings).
- Enable access to utility data that could support label rating systems and make them more accurate.
- Support and expand efforts to incorporate information about energy efficiency into the real estate transaction standard (RETS) and real estate (MLS) databases.
- Undertake statistical research to determine the contributory value of energy efficiency.
- Support training for appraisers and underwriters regarding the contributory value of energy efficiency.

Solution 1.3: Predict and Measure Savings More Accurately

Although energy savings may be less important to a homeowner than the other benefits of a whole-house upgrade, the opportunity to lower bills is still a strong motivation for many homeowners,

particularly those with high energy costs. The argument that an upgrade can "pay for itself" is compelling for some consumers, particularly if financing is available so that the consumer's net monthly bills are lowered immediately as a result.

Selling homeowners – or policymakers – energy savings, however, requires a reasonably accurate prediction of what the energy savings will be. There is widespread agreement within the home performance industry that more should be done to test the accuracy of existing energy modeling tools and support increasingly accurate modeling. To the extent that deemed savings are being used in place of modeling tools, it is important that these savings estimates be as accurate as possible. For contracting firms that offer savings guarantees, accuracy is particularly significant.

A number of approaches to improving the accuracy of modeling tools have been proposed, such as comparisons between the predicted and actual savings of large numbers of jobs to determine the average accuracy of specific contractors and/or programs, and tests of software systems' ability to model a specific home's actual consumption. Use of existing methods to support software accuracy, such as BPI-2400-S-2011, should be expanded. Identification of an approach to testing accuracy that has broad support from a range of stakeholders – including contractors, software developers, programs, and resource markets – and delivers accuracy without imposing undue burdens on developers and contractors, is crucial.

One potentially promising approach to addressing the prediction and measurement issue is to develop strategies to remove some of the burden of modeling from the contractor to the program, particularly if contractors choose not to make quantified energy savings a major part of their sales pitch. The program (or other responsible entity) would then quantify savings, primarily for the purpose of delivering them to one or more resource markets. Quantification methodologies could focus on comparison of pre- and post-upgrade consumption, with consideration of actual measures installed. To the extent that contractors want to sell quantified energy savings to the customer, however, they would still need tools to ensure the reliability of their predictions.

One of the primary barriers to assessing savings more accurately is the difficulty involved in obtaining the billing data necessary to impute the savings that resulted from an upgrade. President Obama's Green Button initiative has provided tools to make this data available on a voluntary basis, but a tremendous amount of work still needs to be done to develop ways to provide the information reliably, consistently, rapidly, and at a low cost to homeowners, contractors, and program administrators. The Electric Consumer Right to Know Act (S.1029), or "eKNOW Act" was introduced in the 111th and 112th Congress to establish the right for consumers to have access to their own electric consumption data, including direct access to the meter. The legislation would have allowed homeowners to designate a third party to access the data on their behalf and then use it to help them become more energy efficient, thus allowing private sector companies and home performance contractors to provide products and services to homeowners and help them reduce their electricity costs.

Home Energy Management systems can serve as another important tool for helping consumers understand their energy consumption. Some of the most sophisticated devices can provide very detailed energy consumption information as well as information about a range of other issues such as occupancy and humidity.

Implementation strategies:

- Develop a national working group on software accuracy tasked with developing a model that delivers accuracy without imposed undue burden on stakeholders.
- Require "true-up" methodologies, such as BPI-2400, that calibrate models with actual billing history.
- Educate decision-makers regarding the importance of making billing data easily available in a way that respects consumer privacy.
- Convene a national working group to develop a strategy for developing an accurate, cost-effective way to test the accuracy of energy modeling.
- Explore the extent to which "smart" devices could provide information about home performance.
- Build on existing efforts to ensure that consumer privacy issues are respected as billing data is accessed.

Solution 1.4: Provide Mechanisms for Making the Other Benefits From an Upgrade More Visible

Residents of a home that has been upgraded often experience a range of benefits beyond lower energy bills. Increased comfort resulting from elimination of drafts and more balanced circulation of conditioned air is one important benefit of a whole-house upgrade that occupants notice immediately. In fact, in some cases increased comfort may be the homeowner's primary motivation for the upgrade. Whole-house upgrades may resolve significant health and safety issues in the home. And an upgrade may increase a home's durability.

Strategies to make these benefits more comprehensible and more visible to homeowners would benefit contractors by providing additional points to sell whole-house upgrades. The most obvious approaches would involve ways to quantify and present to the consumer the wide range of health and safety benefits that an upgrade generates.

Implementation strategies:

- Additional research to quantify the health, safety and other benefits of a whole-house upgrade for consumers.
- Development of systems to communicate health, safety, and other non-energy improvements in a consumer-friendly format.
- Incorporation of the full range of benefits from an upgrade into the "recognition systems" discussed above.

Challenge 2: Reducing Costs to the Homeowner

Major renovations in a home impose significant financial and non-monetary costs on the homeowner. Home renovations require the homeowner to take time to understand what is involved with the upgrade and to provide some oversight of the contractor's work. Preparing the home for the contractor, particularly for renovations that touch multiple areas of the home, also requires the homeowner to commit time and effort. As one obvious example, a home performance upgrade is

likely to require the homeowner to clean out an attic that may be piled with boxes. The time and effort required from the homeowner can be a significant deterrent even if the opportunity cost is not monetary. If the homeowner must take time off work, the loss of income creates an additional disincentive. Low- and moderate-income households can be particularly sensitive to these costs – an important consideration for reaching scale.

This section proposes two closely related strategies for approaching homeowners when they are at a "decision moment" at which energy efficiency could be incorporated into other improvements. The first involves developing ways to tap "reactive" purchases. The second involves spreading a whole-house upgrade out over time through a series of "staged" energy efficiency improvements.

Solution 2.1: Tapping Reactive Purchases

As discussed in the previous section, the time and hassle, as well as the monetary cost involved in overseeing a contractor's work and prepping a home for an upgrade, can be a very significant deterrent to homeowners. The homeowner's cost-benefit calculation can change significantly, however, if energy saving improvements are incorporated into work that she or he was already planning to do. A homeowner typically makes a number of changes and improvements to their home over time: kitchen and bathroom remodels (particularly likely within the year following purchase of the home), HVAC replacement (either because of equipment failure or obsolescence), and roof repair or replacement, are all common modifications. Energy efficiency measures can be incorporated into this work in a variety of ways: HVAC replacement, for example, offers not only the possibility of replacing an inefficient system with a high-efficiency one, but also sizing the unit correctly, as well as insulating and sealing both the ductwork and the entire home. Similarly, rehab work that results in walls being opened creates an ideal opportunity to insulate and air seal, even if such work is conducted only in a part of the home.

Incorporating energy efficiency measures into other planned improvements can reduce costs in several complementary ways. First, the contractor is already on site, and as such does not have to make extra trips to the home to address energy-specific concerns. Second, the work that the homeowner would have "done anyway" may make installation of energy efficient measures easier. Extensive re-plumbing that requires walls to be opened up creates opportunities for insulating. Third, if a homeowner was planning to replace a system, the cost of a more efficient model is likely to be only incrementally higher than a less efficient model that the homeowner may have otherwise have purchased. Finally, this approach can significantly reduce the hidden costs of time and hassle to the homeowner because the work had to be done anyway; the energy efficiency component requires very little additional effort from the homeowner.

Finally, the thousands of HVAC contractors, insulators, remodelers, and other contractors across the U.S. are potential salespeople for energy efficiency upgrades. Many contractors build longstanding customer relationships through maintenance contracts; these relationships could be used to leverage many more whole-house energy efficiency upgrades.

Despite these obvious advantages, there are some significant barriers to incorporating whole-house energy efficiency work into other home improvements. To make money by upselling energy efficiency improvements, a contractor needs to alter their business model or develop an effective strategy for partnering with a firm with complementary skills. Some firms may believe that energy efficiency

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improvements go against their business interests, as in the case of an HVAC contractor that doesn't want to install a right-sized furnace because it costs less, or to take the time to install equipment correctly.

Moreover, a homeowner may want to deal with the immediate issue at hand – the HVAC failure or remodeling work – but not embark on the other aspects of a whole-house upgrade. Promoting whole-house upgrades, in which all energy improvements are conducted at the same time, goes against the way homeowners generally implement improvements. Many of the measures included in a typical whole-house upgrade – HVAC upgrades, window replacement, improved insulation and air sealing – would "normally" be undertaken over many years, and generally happen either because a system fails or clearly needs replacement, or because an opportunity presents itself.

Solution 2.2: Staging Upgrades Over Time

To take into account the way homeowners "normally" conduct improvements, a "staged" approach can be coordinated with the "reactive" approach. This approach encourages homeowners to plan for the long term and implement energy efficiency improvements over time in such a way that they would eventually achieve a certain level of energy savings (i.e. a specified decrease in energy consumption), which might qualify them for a rebate and/or a certificate or label.

This staged approach has several significant advantages. It reflects the way homeowners typically undertake home improvements. It can keep costs low because energy efficiency measures can be bundled with other work that would be done anyway. It can be incorporated into existing contractor business models. Depending on the program design, it could reduce the need for modeling software, if the impact of energy efficiency measures is determined following installation. And it reduces the need for financing, as improvements are paid for over time.

One challenge to implementing this approach is that it requires infrastructure to establish. The program and/or participating contractors must be able to create and maintain a relatively sophisticated

database capable of maintaining information about a very large number of homeowners. Among other things, the program must store "baseline" data accurately so that improvements can be tracked and measured over time. The program must also have the capacity to provide planning and consultation services at the outset and again periodically over time. Finally, the program must have either have confidence in its modeling software or ability to predict how different measures, implemented over several years, will add up to a given level of savings, or the ability to collect data to measure actual savings retroactively. The approach would benefit tremendously from a nationally or regionally recognized certificate or label.

Implementation strategies:

- Work with contractors to reconfigure both program designs and business models in ways that address the structural barriers (i.e., business design barriers) and perverse incentives contractors currently experience.
- Identify the program supports – marketing, branding, QA, incentives, etc. – that would provide real support for participating contractors' efforts to educate customers about the value that their approach adds.
- Launch local pilot programs designed specifically to support the approach, and encourage information sharing between participants.
- Work with contractors so that the approach complements and supports their existing business models.
- Develop the IT and other program infrastructure to support upgrades conducted over time.
- Develop strategies to address and test the technical problems that arise as a result of phasing in improvements over time, such as the challenge of right-sizing HVAC equipment prior to insulation and air sealing.
- Undertake the steps discussed in the previous section to ensure that a range of contractors can participate and contribute to the phased retrofit.

As discussed earlier, these strategies should be designed to complement existing contractor businesses, rather than to create new business models. As such, contractors should be centrally involved in both the planning and development of all implementation steps.

Challenge 3: Risk to the Homeowner

A home performance upgrade entails some risk to the consumer that they will pay a significant amount of money and get relatively little return. Consumers face this danger any time they retain any type of contractor, and significant numbers of consumers are sensitive to it as a result of previous experiences with shoddy work or outright dishonesty. The risks may be perceived as particularly serious for a home performance job because the "product" of the work is relatively intangible. When a home remodeler installs a new kitchen or bath, the homeowner can inspect the work and make a basic determination as to whether the work was done well. But most homeowners find it more difficult to determine whether their air conditioner was properly installed, or whether the air sealing in the attic is effective. Moreover, the bill savings benefits, one of the primary outcomes of the upgrade, are realized over an extended period time, and may be offset by occupant behavior. Comfort benefits, by contrast, are typically immediately obvious to the consumer – one of the reasons that they are a major selling point for whole-house upgrades. Again, the risk issue is most significant for low- and moderate-

income households, for whom the $5,000 to $15,000 outlay for an upgrade is a very significant amount of money.

Solution 3.1: Reduce Risk Through Quality Assurance

A third major strategy for enhancing the consumer value proposition involves reducing the perceived and real risks associated with home performance upgrades. Selecting and overseeing a contractor is a daunting task for many homeowners, and these challenges are compounded in the case of a home performance job, which involves items that the average homeowner is unfamiliar with. It is much easier for a homeowner to determine whether a kitchen upgrade has been carried out according to scope, for example, than to determine whether an HVAC system has been installed correctly or that all appropriate air sealing and insulation work has been completed.

Most home performance programs have a quality assurance (QA) system in place. These systems typically involve both "desk checks" of reports on job completions and site visits of a proportion of a contractor's jobs. However, the national approach to QA as a whole would benefit from standardization, and from identification of processes that achieve quality work while supporting (rather than burdening) contractors.

Implementation strategies:

- Study extent and ways in which consumers see a value in QA, and develop protocols, particularly those related to customer interactions, accordingly.
- Study extent to which contractors see a benefit in QA and design both QA and complementary marketing/branding systems that maximizes benefit to contractors while addressing the needs of consumers.
- Convene stakeholder group for developing strategies to make QA quicker and easier through standard protocols and better data transfer.

Together, these factors – the modest nature of the financial savings, the hidden costs of "hassle" and lost time, and the risks involved for any single homeowner in realizing projected savings – result in a dubious value proposition for the homeowner. Until the value calculus is significantly reconfigured, it is unlikely that a market for whole-house upgrades will develop in the near future.[5]

[5] It should be noted that LBNL's excellent *Driving Demand* study identifies a wide range of strategies for educating consumers and developing a compelling message about home performance upgrades, but only addresses the underlying issue of the value proposition tangentially.

Section 2: Developing a Consumer Market for Whole-house Upgrades

Issues Other Than the Consumer Value Proposition

The consumer value proposition is central to the industry because without strong consumer demand, there is no real possibility for the number of upgrades a year to reach a meaningful scale. However, there are other issues slowing the expansion of home performance. The factors that influence contractor profitability are second in significance only to the consumer value proposition. Lack of strong messaging and branding, as well as inadequate sources of appropriate financing are also significant barriers to the industry's expansion.

Challenge 4: Contractor Profitability

Contractor profitability is crucial to the success of the whole-house upgrade industry. Contractors are the engine of the industry; unless they are motivated by sufficient profits to make sales and carry out the work, no jobs will be completed at all. The potential to make profits will attract the highest-quality contractors necessary to achieve real energy and other savings. Conversely, if there the profits to be made in home performance jobs are marginal, few contractors, and even fewer high-quality firms, will want to carry out such projects.

Strong consumer demand is probably the most important driver of contractor profitability, which is why it was addressed first in this paper. However, there are a number of other factors beyond effective customer demand that affect contractor profitability, and these should be addressed systematically to make the home performance industry as profitable and supportive of high-quality contractors as possible. Strategies to reduce unnecessary contractor costs are particularly important. Contractors who work within programmatic contexts to provide whole-house upgrades frequently face challenges with reporting and other bureaucratic requirements that drive up labor costs and reduce profit margins.

For contractors who work in areas covered by several programs, costs are typically further increased, and profits correspondingly diminished, by different reporting and other program requirements. Contractor training and certification is also expensive: some training is clearly necessary to provide the contractor with the skills to carry out a whole-house upgrade, and is valuable in differentiating a home performance contractor from competitors, but there is a question as to optimal amount of training to transmit the necessary skills without imposing an undue cost burden.

Actions to address these issues would play an important role in supporting the development of markets for home performance upgrades by reducing cost that contractors need to charge for an upgrade.

Solution 4.1: Standardize Program Requirements and Operations

Many contractors work in multiple program areas and have to deal with different and sometimes conflicting program requirements. The effort required to address these differences can be a significant business cost, and may make the difference in a contractor's decision to engage in the whole-house

upgrade business.

Stakeholders have identified a number of areas of programmatic work that would benefit from national standardization and application of best practices. Although none of these are crucial to the operations of a program, together they can make a significant impact on a program's ability to deliver high-quality energy efficiency upgrades in a cost-effective way. National standards for file and on-site field inspections, for health and safety testing and measure implementation, and for quantifying the impact of measures would all enhance programmatic effectiveness.

Implementation strategies:

- Develop a comprehensive, prioritized list of all standards necessary for the industry and conduct a gap analysis to identify those that still need to be completed.
- Develop an implementation plan for creating all standards in order of priority.
- Develop a national working group of program administrators to develop strategies for standardizing program operations.
- Support national outreach efforts to promote adoption of national standardization in a wide range of program areas.

Solution 4.2: Make Data Collection and Transfer Quick and Easy

One of the most important factors affecting program efficiency and ability to reduce cost burdens on contractors is information technology (IT). IT is central to program operations, which rely on the communication and analysis of large amounts of data. Contractors use software to capture data about a project, generate reports and proposals for consumers, and model energy savings, among other business purposes. Program administrators typically use software to manage a range of functions, including storage of program-related data in a database and reporting to program sponsors (states or utilities) and Federal agencies. Contractors and program administrators may also be working to obtain data from utilities for EM&V purposes.

The many software programs needed to fulfill these different functions may be integrated or interoperable, but they frequently are not. The recent trend to encourage market competition among software providers is exacerbating the problem by engaging more interacting systems rather than fewer. In this context, good software, and integration and standardized data reporting, have the potential to generate very important cost savings for both programs and contractors. Without high-quality IT systems, gathering data, reporting, and carrying out other related activities are extremely expensive and labor-intensive propositions.

At present, however, programs do not have access to IT systems that would allow them to realize these efficiencies. Current data standards, including the Federal Green Button initiative and the BPI data collection and transfer standards, will contribute to progress in this area, but need to be supplemented by additional work. This is an area in which collaboration among programs and efforts to coordinate on specific projects could be beneficial, although IT is an area in which potential economies of scale needs to be balanced by the need to promote a healthy competition among vendors in the marketplace.

Implementation strategies:

- Complete development of initial versions of national data standards and make periodic revisions to reflect lessons learned through implementation.
- Convene a working group of program administrators to support standardization, and identify and develop strategies to deal with emerging data-related problems and issues.

Challenge 5: Lack of a Strong Message and Brand

Energy efficiency is a complex field, and lack of homeowner understanding is often cited as a key impediment to growth of the field. While not as significant as some of the barriers discussed above, a broader and better public understanding of the benefits of whole-house upgrades would undoubtedly support growth to scale.

Solution 5.1: National Branding and Marketing Campaign

Although the consumer value proposition is a more significant problem than marketing and consumer education, the home performance industry would benefit tremendously from a well-designed, well-executed national marketing campaign, possibly modeled along the lines of a Public Service Announcement (PSA).

A marketing campaign could be designed around a national recognition system, as discussed in Section 1.2 above. The campaign could develop a broad public awareness of the system and educate consumers about the details of what it means, thereby supporting integration of the system into the real estate value chain in a way that enhances the value of homes that receive upgrades.

A national marketing campaign should be designed to benefit contractors by making lead generation easier and reducing the cost of customer acquisition. This effect will be indirect, but it could nonetheless be significant. Manufacturers, contractors and distributors should be centrally involved in creating the campaign, and could even take the leading role in creating it.

It should be noted, however, that the benefits for a large-scale marketing campaign will be greater to the extent that the other infrastructure designed to support the success of the home performance industry is in place.

Implementation strategies:

- Identify the resources to launch a national marketing/branding campaign.
- Retain a professional firm to design the campaign.
- Ensure adequate stakeholder engagement and buy-in in the effort, with contractors being major if not primary stakeholders.
- Test the campaign in target markets before a national roll-out.

Challenge 6: Financing

Financing, as noted earlier, has been widely seen as a major barrier to the growth of the home performance industry, yet - at this point in the industry's development - is probably much less significant an obstacle than most of the issues discussed above. Given that financing on extremely attractive terms has been made available in some areas without significantly driving uptake suggests that the consumer value proposition, not lack of financing, is the more important problem.

The reactive and staged approaches could significantly reduce the need for financing programs designed specifically to cover the costs of whole-house upgrades, partly because the staged approach allows the homeowner to pay for upgrades over time (a "payday upgrade" approach), and partly because contractors can partially support the upgrades through their existing financing mechanisms.

The challenges involved in financing hundreds of thousands of upgrades are not irrelevant, however, and are likely to become more important over time. As the industry moves from relatively affluent and motivated early adopters to the broader population of homeowners, convenient financing mechanisms will be necessary for consumers who have limited cash and financing options. And financing tools could play an important role in attracting quality contractors to the home performance field. Accordingly, developing appropriate financing products that can support whole-house upgrades is an important medium-term goal for the home performance industry.

Solution 6.1: On-bill Financing and Standardized Unsecured Loans

Recent experience with financing programs indicates that products that can be originated rapidly and without extensive paperwork, and that carry rates around that of a traditional mortgage, are attractive to consumers willing and able to incur debt. The early experiences of on-bill finance and collection programs suggest that incorporating payments on energy efficiency loans into the utility bill payment process is a promising approach. The infrastructure for a secondary market for unsecured energy efficiency loans generated through the WHEEL program is a financing strategy with long-term

potential. Loan pools for both the on-bill and consumer loan products could be funded by state or Federal bond issuances.

Much of the work to develop infrastructure for these programs has already been conducted. At the point, the industry needs time to implement the strategies, and mechanisms for sharing information about what is and is not working.

Implementation strategies:

- Support the development and standardization of unsecured consumer loan products, with the goal of developing a strong secondary market for them through the WHEEL initiative.
- Support the development and expansion of on-bill financing and repayment programs.
- Disseminate best practices in establishing and administering on-bill programs.

Section 3: Accessing Markets for Energy Efficiency as a Resource

Whole-house energy upgrades have the potential to create value for a range of other stakeholders in addition to homeowners. Most obviously, utilities can benefit from energy efficiency in a variety of ways: meeting capacity needs, meeting EEPS goals, and possibly reducing their long-term need for new supply-side resources. Energy efficiency also has value in nascent carbon markets, as demonstrated by the northeast Regional Greenhouse Gas Initiative (RGGI). And there is a possibility that over the long term other actors, such as insurance firms, might find value in the health benefits generated by whole-house upgrades.

A small number of programs have begun to work towards strategies for monetizing these other values generated by energy efficiency measures generally, and whole-house upgrades specifically. The regional capacity and carbon markets have been the easiest places to explore selling energy efficiency as a resource. A more ambitious goal would be to sell energy efficiency as a resource to utilities, possibly through a program with a generic similarity to "white tag" initiatives.

However, efforts to tap these opportunities are in the very beginning stages. To fully realize them, the home performance industry needs to address five challenges.

Challenge 7: Cost-effectiveness Tests

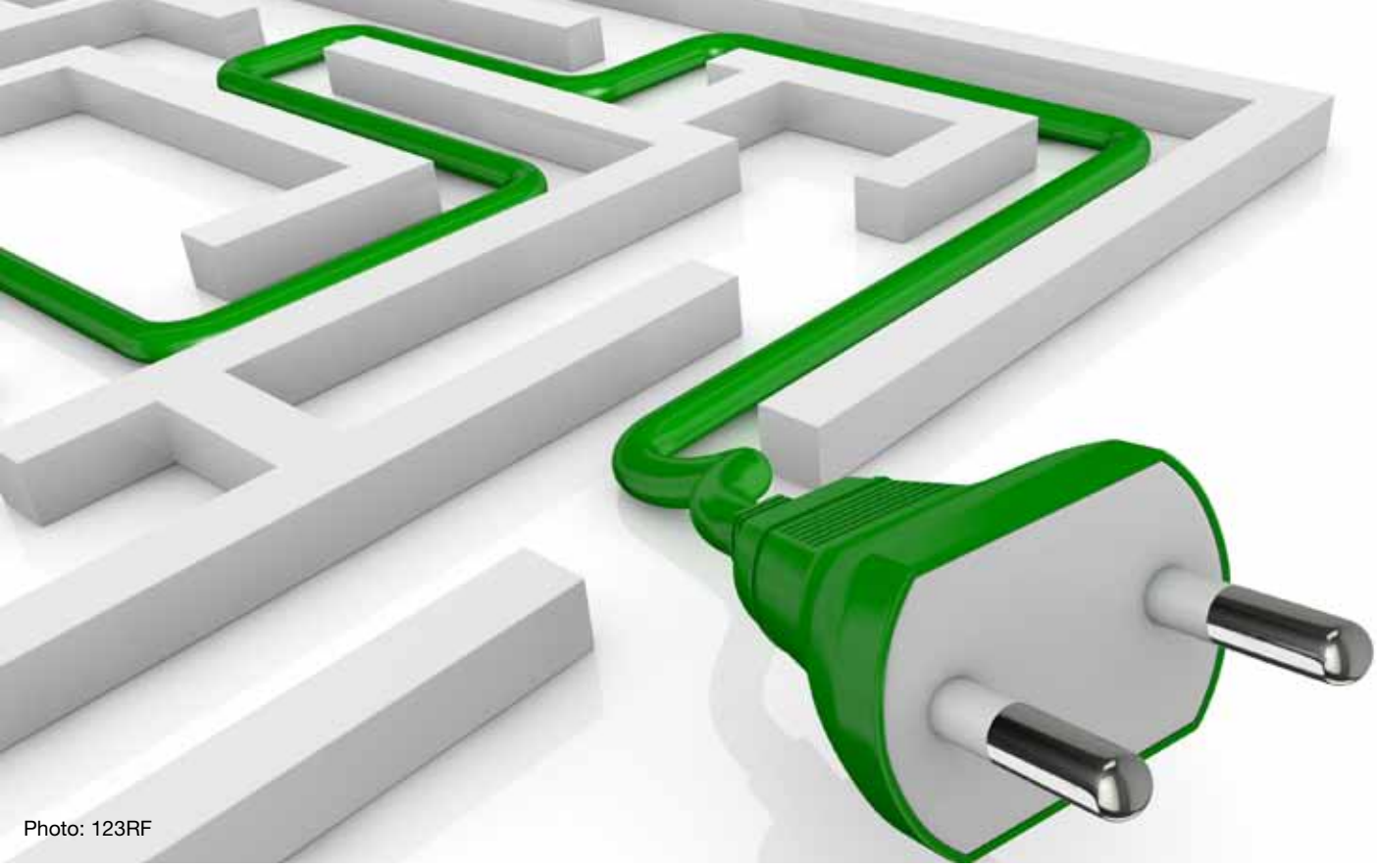
At present, cost-effectiveness tests impose limits on the creation and expansion of some home performance programs. Most whole-house programs find it difficult to clear several of the tests, notably the Total Resource Cost test (TRC), as commonly implemented. Failure to clear the bar on one or more tests has prevented new programs from being created, constrained the design of programs that are launched, and in some cases threatened the future of existing programs.

Solution 7.1: Change Test Implementation to Incorporate Best Practices

In the immediate term, it is important for the home performance industry to support the reform of cost-effectiveness test implementation through the application of best practices. At present, most tests are implemented in ways that are not consistent with the underlying goals and rationales of the tests – which leads to test results that are meaningless at best and highly misleading at worst.

Implementation strategies:

- Encourage industry-wide support for best practices in test implementation as recommended by Synapse Energy Economics, RAP, NHPC and others.
- Continue development of research into best practices.



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Solution 7.2: Encourage Abandonment of Tests If Adherence to Best Practices Cannot Be Achieved

The challenge of implementing best practices, particularly in the case of the TRC, is that proper implementation can be extremely complex and expensive. The TRC also introduces an unusual level of paternalism into market dynamics that would be particularly inappropriate in the face of robust consumer demand for upgrades. Finally, cost tests are not applied to supply-side energy resources, and are increasingly inappropriate in a context in which energy efficiency is emerging as a potentially significant resource.

In the longer term, the home performance industry, utilities, and (most importantly) consumers would be best served by elimination of the cost-effectiveness tests as they are currently implemented. The logical alternative would be a system in which the utility values energy efficiency primarily in terms of its cost relative to the cost of other resource options, and secondarily in terms of broad policy benefits, such as bill reduction for low-income consumers. It should be noted that the Program Administrator Cost test (PACT) is the current test that comes closest to supporting decision-making based on such principles.

Implementation strategies:

- Encourage elimination of cost-effectiveness testing if best practices cannot be adhered to.
- Promote treatment of energy efficiency as a resource, with evaluation made primarily in terms of its cost relative to other resource options.

Challenge 8: Utility Obligations and Incentives

Although a serious problem, cost-effectiveness tests are only a manifestation of a larger problem that would remain even if all cost-effectiveness testing were abandoned. The nature of typical utility

compensation structures creates material dis-incentives to promote energy efficiency, in that utility compensation is determined in part by the volume of energy sales. Some means is thus required to encourage utilities to support energy efficiency in the face of this material disincentive.

The challenge of utility incentives could be addressed by legislated requirements that utilities achieve a certain level of energy efficiency. However, over the long run, providing utilities with a positive incentive to consider energy efficiency in the way they would any other energy resources is likely to have profound benefits.

Solution 8.1: Energy Efficiency Portfolio Standards and Performance Obligations

Energy efficiency portfolio standards (EEPS) are important tools for increasing energy efficiency. Requiring a certain portion of the energy demand to be met with energy efficiency forces utilities that may have been reluctant to advance energy efficiency measures to advance those measures. Data collection is again crucial in advancing an EEPS so that the relationships between energy efficiency measures installed and actual energy savings can be analyzed and understood.

Another mechanism to support whole-house upgrades is to impose an obligation to achieve a specific level of energy savings through efficiency measures. Historically, performance obligations have often driven single-measure rather than whole-house upgrades, but they could be structured to support a whole-house approach. Many different types of entities could be responsible for implementing and achieving the performance obligations.

Implementation strategies:

- Work with other organizations to support and promote the implementation of Energy Efficiency Portfolio Standards and performance obligations

Solution 8.2: Decoupling Utility Profits from Energy Sales

For decades, energy efficiency advocates have struggled with the fact that traditional utility incentive structures allow utilities to generate more revenues and profits by selling more energy – a disincentive to promoting energy efficiency programs that will reduce energy consumption. Strategies for eliminating this perverse incentive are generally termed “decoupling mechanisms”; they function by severing the direct connection between utility revenues and the volume of energy sales. Decoupling is an important first step towards creating a market in which utilities have a real stake in energy efficiency programs. The political environment may be more supportive of decoupling in jurisdictions in which energy efficiency or carbon reduction standards are in place, because these standards give utilities a reason to consider the traditional incentive structures.

Implementation strategies:

- Work with other organizations to support and promote existing efforts to support decoupling.

Solution 8.3: Providing Utilities with Incentives for Creating Energy Efficiency

Even in jurisdictions in which this disincentive has been eliminated through decoupling mechanisms, most utilities still have no positive financial incentive to support energy efficiency. In general terms, utilities can generate income from investments in supply-side, but not demand-side resources. This obvious imbalance is a fundamental deterrent to strong utility commitment to realizing all cost-effective energy efficiency resources.

To really drive utility engagement in energy efficiency, utilities should be given a positive incentive to invest in efficiency, in the way that they have incentives to invest in supply-side resources.

Proposals to incentivize utilities to invest in energy efficiency have been circulated for years, but have not been widely implemented. However, the few jurisdictions in which such incentives have been implemented, notably Massachusetts, suggest that they can serve as a powerful incentive to encourage utilities to support energy efficiency.

That said, the politics of altering utility compensation are complex and involve a range of powerful vested interests. This is not a project that the home performance industry should expect to take on by itself. However, the industry can and should look for ways to promote dialogue on this issue and to collaborate with other organizations and sectors in promoting change.

Implementation strategies:

- Support implementation and expansion of performance incentives that are structured to support whole-house upgrades.
- Support continued research on the issue of restructuring utility incentives, such as that conducted by LBNL and RAP.
- Collaborate with utilities supportive of energy efficiency to press for change in incentive structures.
- Identify other organizations and sectors with a stake in changing utility incentives, and develop strategies for partnership.

Challenge 9: Rising Rates

The larger goal for energy efficiency programs is to replace the need for supply-side resources, through retirement of older, dirtier and inefficient plants, and/or reduction in the size or number of new ones. However, the growth of efficiency programs will impact rates, and the larger the efficiency programs, the greater the impact on rates. Investor-owned utilities' rates are, in general terms, derived through a formula that divides the utility's "revenue requirement" by the anticipated quantity of energy (therms or kilowatt hours) required by the utility's customers. If energy efficiency programs significantly decrease the quantity of energy required by the system, the utility's fixed costs will be divided by the smaller number of therms or kilowatt hours that the utility delivers, resulting in higher rates per unit of energy. The increase in rates will not pose a problem for the consumers who have had their homes upgraded, because the savings realized by the reduction in energy consumption will more than compensate for higher rates. Consumers who still have energy inefficient homes, however, could end up paying considerable more for energy. Commissions and utilities are extremely sensitive to

rising rates, even if energy efficiency results in a net lowering of expenditures on energy for all utility customers.

Solution 9.1: Address the Rate Dilemma Through Scale

Given current utility compensation structures, significant growth in energy efficiency programs will result in rate increases, even if bill savings fall for consumers who participate in efficiency programs. This "rate dilemma" represents a significant challenge for the energy efficiency industry. One important, if counter-intuitive, strategy for addressing this dilemma is to expand programs rapidly and ensure that they are designed to reach large segments of the population so that any person or business that suffers as a result of rising rates has the opportunity to realize bills savings through participation in an energy efficiency program. Support for weatherization programs that assist low-income homeowners could also be extremely significant in this context.

Implementation strategies:

- Commission research on rate impacts and strategies for mitigating the impact on vulnerable ratepayers.
- Support broader knowledge and understanding of scale as a solution to rate impacts.

Challenge 10: Technical Challenges

Selling negawatts involves a number of significant technical challenges. Forward capacity and carbon markets exist only in some areas of the country, and both are still in relatively early stages. At present, energy efficiency is not sold as an energy resource anywhere in the U.S.

Moreover, even in the markets that exist, potential sellers of energy efficiency need to clear significant technical hurdles to be able to sell energy efficiency, and the forward capacity markets in particular entail some financial risks. To take advantage of these markets, programs need technical expertise and access to capital.

Solution 10.1: Knowledge Sharing

A relatively small number of organizations are working through the technical challenges of selling energy efficiency to capacity and carbon markets. Existing efforts to share the nuts and bolts of how to tap these markets should be supported and encouraged.

Implementation strategies:

- Establish a national stakeholder working group for all programs and other entities currently selling or seeking to sell energy efficiency as a capacity, carbon or other resource to promote knowledge-sharing.

Challenge 11: Data Collection and Transfer

Because both capacity and carbon markets rely heavily on evaluation, measurement and verification

of actual savings, strategies to facilitate the collection and flow of data are crucial. Unless savings are accurately and reliably measured, they cannot be sold. The risks involved in overestimating efficiency savings when selling into some markets are significant enough that, in the absence of good data, sellers of energy efficiency make conservative projections, thus effectively underselling their product.

Access to accurate data, particularly energy consumption data, is thus a fundamental need for the development of markets for energy efficiency. The need for reliable consumption data from utilities is particularly important, but making the collection and transfer of data about the specifics of whole-house upgrades easier for contractors and program administrators and program sponsors will also be important.

Solution 11.1: Data Access Policies and National Data Standards

The need for the data necessary for advancing evaluation, monitoring, and verification is clear and could be addressed through national policy measures, including the proposed eKNOW legislation. National standards, including those discussed above in previous sections, could also support the collection and transfer of data, particularly upgrade-relate information.

Emerging "smart" technologies may provide an alternative path to accessing some of this data (e.g., from a monitoring device in the home rather than at the meter). While this emerging field may provide an alternative path for data access, it does not alter the importance to ensuring the availability of meter data.

Implementation strategies:

- Support policies that facilitate transfer of energy consumption data to customers and relevant third parties.
- Support integration of "smart home" technologies into home performance programs to allow for collection of detailed consumption and occupancy data.
- Advance data standards designed to facilitate the collection and transfer of data that support quantification of energy savings for resource purposes.

Challenge 12: Absence of Markets for Energy Efficiency As a Resource

One of the most obvious challenges to the goal of selling energy efficiency realized through whole-house upgrades is that, even if the significant issues concerning incentives were addressed, capacity and carbon markets do not yet exist in many parts of the country. New England and the Mid-Atlantic have operating capacity markets, and several regional carbon markets are in different phases of development, but there are areas of the country where home performance programs have no obvious outlet to sell any negawatts that they generate.

Solution 12.1: Support for Market Development

The development of new capacity and carbon markets is a project considerably beyond the existing resources of the home performance industry. However, because the industry could benefit so significantly from these markets, the development of ways to support their creation and/or expansion

should be considered, and should be a part of the industry's long-term plan.

Implementation strategies:

- Document the success of existing resource market mechanisms, including regional capacity markets and carbon initiatives, in supporting goals including both use of energy efficiency as a low-cost resource and achievement of climate goals.
- Support policies that replicate these market structures in other areas.
- Explore other market approaches, such as quantification of health benefits or enhanced building durability, for insurance purposes.

Section 4: Implementation

The identification of key challenges, as well as strategies to address them, is essential ifor the development of a roadmap for the home performance industry. The other indispensable component of the roadmap is a clear description of a process through which strategies can be implemented.

This process should include:

- Agreement on the strategies that need to be implemented for the industry to reach scale.
- Prioritization of strategies, from ones that must be worked on immediately to ones that can be deferred or that can be pursued according to a slower timetable.
- Assignment of responsibility for implementing strategies to appropriate actors.
- Identification of the resources necessary to implement each strategy.
- Explicit procedures for testing strategies so that they can be modified or discarded based on results.
- A strategy to coordinate and share knowledge about efforts on an on-going basis.

Agreement Regarding Strategies

In previous sections this paper has recommended the following strategies to bring the home performance industry to scale.

To develop a consumer market for whole-house upgrades:

1. Expand well-designed incentive programs at a national level, if possible.
2. Develop a national recognition system (or develop a strategy for coordinating multiple recognition systems if a national system is not possible).
3. Support more accurate prediction and measurement of energy savings.
4. Develop systems to integrate energy efficiency into reactive purchases.
5. Develop systems for implementing whole-house upgrades over time.
6. Reduce homeowner risk through quality assurance programs.
7. Standardize incentives and program operations nationally.
8. Make data collection and transfer easy and inexpensive.
9. Launch a national marketing and branding program.
10. Develop appropriate financing programs.

To develop a market for energy efficiency as a resource:

1. Promote best practices for the implementation of cost-effectiveness tests;
2. Promote the elimination of tests if they cannot be implemented according to best practices;
3. Promote strategies to support development of performance obligations.
4. Promote changes to utility incentive structures that remove perverse incentives and provide positive incentives that encourage utilities to treat energy efficiency as a resource.
5. Promote growth of efficiency programs to a scale that can resolve the rate increase dilemma.
6. Share knowledge and best practices regarding the sale of energy efficiency as a resource.
7. Make data collection and transfer easier.

These lists draw from numerous conversations and meetings with stakeholders, and as such are designed to capture many of the leading proposals and ideas within the industry. However, as previously mentioned, this list is not intended to be definitive. It is designed to start the conversation, not finish it. A stakeholder process that completes the work of identifying relevant strategies is essential for the industry to move forward.

Prioritization

Prioritization among the strategies listed above is difficult, since most home performance experts would probably identify all of them as important. However, since the industry does not have the resources to undertake all strategies well simultaneously, broad agreement on which projects should be implemented first would benefit the growth to scale.

This paper advocates prioritization of five consumer market development strategies:

- Expansion / development of incentives, particularly at the Federal level.
- Development of a coherent, national recognition system.
- Development of processes to support reactive and staged upgrades through programs.
- National standardization of program operations and requirements.
- Improvement in data collection and transfer mechanisms.

A significant national incentive would be a game-changer, and, as such, is worth pursuing even if the passage of legislation authorizing it is relatively unlikely in the near term. A national incentive should be designed to support other programmatic changes, and could help to drive program improvements and standardization along the lines discussed above.

A national recognition system could significantly change the industry's prospects, although over a longer time frame than would a new incentive program. Because of the length of time required to roll out a recognition system and integrate it into the real estate value chain, work on this strategy should be a high priority for the industry.

The processes to implement staged and reactive upgrades and to improve data collection and transfer have the advantages of being strategies that can support growth of the home performance industry even in the absence of major incentive programs. Work on these two strategies should be prioritized, both because they will make significant contributions to the industry in their own right, and because they offer an alternative path to scale if it is not possible to secure significant new incentives for the industry. Both strategies would be supported and enhanced by successful implementation of a national recognition system.

To achieve a robust market for energy efficiency as a resource, this paper recommends a short-term focus on supporting best practices in cost-effectiveness testing, including movement to simpler tests such as the Program Administrator Cost test if the financial and technical demands of conducting the TRC correctly prove excessive. Work on the rate impacts of energy efficiency programs is also crucial.

Over the longer term, strategies to alter utility compensation structures in a way that incentivize investment in energy efficiency need to be developed and implemented – with the recognition that the home performance industry cannot do this work alone.

Again, it should be emphasized that this prioritization is intended only to encourage further discussion, not to provide a definitive statement. However, this paper strongly encourages stakeholders to continue a discussion that identifies and results in a consensus on priorities, because the available resources do not permit work on all promising strategies simultaneously.

Identification of Resources

In a post-ARRA context, resources to implement the strategies that the home performance industry needs to pursue to achieve scale are relatively scarce, but not non-existent.

The Federal government could be a source of significant funding for a national incentive program and other measures to enhance the industry, either through an energy bill or through stand-alone legislation. However, there is no guarantee that this Congress will act on any energy efficiency-related measures.

In the absence of new Federal legislation, the Department of Energy will have limited funds. That said, the department might be able to access some resources to support implementation of strategies to bring the field to scale. The most likely candidates for such support would be initiatives that have national implications, such as the development of standards or systems.

Programs – whether utility, state, municipal or non-profit based - have budgets that allow major investments in large-scale strategies designed to help the industry. Most, however, are making expenditures in areas related to some of the key strategies, or have limited discretionary funds available. These resources might be pooled together to support at least one or two projects, if common agreement regarding priorities and sufficient coordination can be achieved.

Many of the national foundations that have historically supported energy efficiency have expressed interest in supporting a strategy that would enable the industry to grow to scale, as per the recent report by the Energy Futures Group commissioned by the BRIM collaborative. These resources might be used to support one or more of the key strategies.

If existing resources are not sufficient to support implementation of all the strategies identified in the report – and they almost certainly are not – they should be directed first to ensuring effective implementation of the five strategies identified in Section 8.3.

Assignment of Responsibility for Implementation

The strategies listed above fall into several groups. First, a number of strategies could be dealt with most effectively by organizations focused on shaping national policy (i.e. through Executive or Congressional action). A second set of strategies involve national standards and tools, which could be created by a national entity - either a federal agency (DOE or EPA) or a non-profit organization with national scope (BPI and RESNET, NHPC, Efficiency First, etc.). A third set of strategies could be designed and implemented by local programs – with the caveat that such efforts should be incorporated into a larger process so that program development at a local level can be shared. Finally, contractors need to be actively engaged in all of these processes, particularly those involving program design activities, such as developing strategies to tap reactive markets and stage retrofits over time.

Division of responsibilities might look something like the following:

National policy/Research/Trade organizations

- Incentives
- Branding and marketing
- Data collection and transfer
- Financing

Department of Energy and national organizations working closely with stakeholders

- Development of a standard, high-quality QA process
- Standardization of program requirements
- Recognition systems
- Software accuracy
- Data collection and transfer

Programs and contractor organizations

- Development of supports for reactive purchases and staged upgrades
- Development of financing tools (on-bill and securitize-able unsecured loans)
- Knowledge-sharing regarding sale of energy efficiency as a resource

Development of specific plans to address some of the challenges involved in developing energy efficiency as a resource, particularly those that require research and broad recommendations, are best implemented by national organizations. However, the strategies that require policy changes at the state or local level require stakeholders who have the capacity to interact with state legislatures and commissions and press for the necessary reforms. As a result, significant progress in developing markets for energy efficiency is most likely to occur as the result of strong partnerships between national research-policy organizations and local policy-advocacy organizations. Specific strategies that could be implemented through coordinated national and local stakeholder work include:

- Promote best practices in the implementation of cost-effectiveness tests.
- Promote elimination of tests if they cannot be implemented according to best practices.
- Implementation of performance obligations.
- Promote significant changes to utility incentive structures.
- Promote growth of efficiency programs to a scale.

Coordination of Activities

Coordination of implementation efforts is one of the most important features of an industry-wide effort to grow to scale. A coordinating process will be required to frame the broad contours of the roadmap and fill in the details. It will also be required to coordinate the implementation of key strategies in a way that ensures that the most vital tasks are being carried out.

Conversations related to the development of a home performance industry roadmap - both formal and informal - have been occurring for years, but have a new sense of urgency as ARRA funds dwindle. At this point, conversations need to be focused and debates about issues where there is genuine disagreement need some structure. A coordinating organization could facilitate the evolution of conversations into an actual roadmap by:

- Creating and circulating documents designed to focus discussion by synthesizing the state of conversation and encourage comments and critique, possibly through a public, online document.
- Convening public forums for debate about specific issues once there is broad agreement regarding the outline of a plan.
- Developing and circulating a consensus document.

Coordination at the implementation phase is required to ensure both that organizations assume responsibility for implementing projects, that implementation stays on track, and that lessons learned are circulated rapidly.

All implementation efforts should be coordinated with policy initiatives. New and existing legislation should incorporate and advance the strategies identified in the roadmap. New incentive programs, for example, should be structured to support staged upgrades.

Not all of these coordinating functions need to be provided by the same organization, but coordinating bodies should communicate closely among themselves.

Testing of Implementation Strategies

All implementation efforts should include a detailed plan for evaluating and testing results. Feedback loops should be designed to be short, so that course corrections can be made and lessons shared as soon as possible.

Both the implementation and evaluation plans should be designed to avoid creating disincentives to report subpar performance or failure; poor results are inevitable in a testing process, but nothing will be learned if they cannot be honestly reported and discussed.

To the greatest extent possible, strategies should be implemented in several different geographic areas to ensure that they can perform well in a range of conditions, or to verify that they can perform in at least some circumstances.

Conclusion

There is a lot at stake for the home performance industry in coming together around a plan for the next decade. Realizing the energy efficiency potential of residential buildings is notoriously difficult. In a period in which funding is likely to be limited, it is crucial for the field to agree on the most important projects, and to explain them convincingly to potential supporters and allies.

Broad agreement on many issues among the participants at recent meetings designed to address large strategic issues suggest that the home performance industry is close to agreement on many of the essential points of a roadmap for the next few years. In this context, a process for developing and strengthening consensus around key goals and strategies is crucial.

This paper is intended to help serve as a starting point for discussion. As discussed above, the work to develop a roadmap involves:

- Key challenges/barriers.
- Solutions to the challenges, framed as action items.
- Prioritization of action items.
- Assignment of responsibility for implementation of key action items.
- Identification of reso:urces available to support implementation.
- A process for coordinating activities and maintaining communication throughout the process.
- Clear processes for testing strategies and abandoning ones that don't work.

A range of online tools, from Google Docs and Google Chat to Basecamp could allow broad stakeholder discussion. Active moderation of these conversations would be helpful to ensure that they remain productive. If online tools can be used to support a general consensus, details, particularly regarding contentious issues, might be resolved through in person stakeholders meeting.

The home performance industry is at a critical stage. It has a constituency, a leadership, and purpose. It has proven that it can save significant energy from the notoriously difficult to tap energy waste in the existing residential market. If home performance can grow to a sustainable and profitable field, it can be a game-changer for a nation in desperate need to reduce its energy consumption.

Appendix A: Other Roadmap Documents

The DOE HPwES Program Report

DOE's Home Performance with ENERGY STAR® Program Report, issued in January 2013, is designed as a multi-year plan that works toward "scalability" of the program (DOE 2013: 1)." The plan identifies three workstreams, the first focused on achieving greater standardization of the Home Performance with ENERGY STAR® program, the second focused on testing a set of approaches through pilot programs, and the third focused on more significant program and policy changes. The areas to be standardized as part of the first workstream include development of minimum criteria for a home energy assessment, health and safety testing, and performance testing, as well as standardization of performance and prescriptive approaches to upgrading the home, and science-based guidance regarding workscope development. In their general support of standardization and the specific work on areas identified as priorities in this report, such as QA, the DOE plan is consonant with the recommendations in this document.

The second workstream identified in the program report is designed to test pilot programs in the areas of:

- Standardization of data collection
- Ventilations requirements
- Systems and trades-based opportunities
- Performance metrics and evaluation tools
- Delivery models

The standardization of data collection corresponds to the emphasis in this paper on the importance of data collection and transfer. And this paper recommends development of systems and trades-based opportunities, specifically within the framework of reactive programs and staged upgrades.

The third workstream includes several policy and program activities, including:

- Interagency collaboration and coordination
- Workforce certifications and standard work specifications
- Asset ratings
- Labeling and branding
- Evaluation of energy modeling tools

The asset rating, labeling and branding, and evaluation of energy modeling tools in particular are clearly closely aligned with this report's recommendations.

Despite these broad areas of agreement, there are some significant areas of difference between the Program Report's recommendations and those contained in this report. First, the Program Report understandably does not allocate direct responsibility to any parties except DOE, although it indicates that responsibility for a number of pilot projects will be assumed by third parties, nor does it identify ways to engage other stakeholders apart from soliciting comments. As DOE cannot (and should not) undertake all the work necessary to advance the home performance industry, this leaves a need to. Second, the Program Report does not address resource markets in any significant way, leaving this

important area of action largely unaddressed. Third, some of the key projects identified in the Program Report, including labeling, branding and modeling issues, are staged relatively late in the timeframe; this report suggests that the significance of these issues for moving the home performance industry forward is such that work on them should begin as soon as possible.

The BRIM report

The Building Retrofit and Industry Collaborative (BRIM) funder collaborative commissioned a report to follow up on the stakeholder process held during the summer of the previous year. The report, completed in January 2013, identifies three particularly significant areas for the industry: 1) development of state roadmaps, 2) development and promotion of new models for utility cost-effectiveness, and 3) development programs to drive consumer demand. It also proposes a specific research agenda involving case studies of programs, research into non-energy benefits (NEBs), and research on consumer decision-making.

Many of the key challenges discussed in this support should be addressed through national processes, and for this reason the development of state roadmaps could be premature. Given the importance of standardization, a proliferation of state roadmaps could create problems for the industry. However, much of the policy work that will drive the industry, including energy efficiency portfolio standards and policies governing utility programs, will occur at the state level, and in this context a state-by-state focus is important. However, in is important that state roadmaps be coordinated with national research and implementation processes and support national standards whenever possible.

Regarding utility cost-effectiveness, the BRIM report observes that the utility cost-effectiveness challenge is multi-faceted: noting that shareholder incentives are an important issue, and recommending evaluation based on climate goals, for example. The research recommendation that addresses this area, however, is focused on quantification of non-energy benefits (NEBs). Although this could be a useful project, it does not address the more significant challenges of developing markets for energy efficiency as a resource, which include addressing utility incentives.

The BRIM report's specific proposals to support driving demand – including benchmarking or rating (discussed herein as a "recognition system"), supporting access to and analysis of utility data, and national branding / marketing initiatives – mirror some of the recommendations in this document. Again, the key research proposal related to this area focused on a relatively limited issue – consumer decision-making. This paper's argument that the consumer value proposition is central to taking the home performance industry to scale suggests that such research could be important, but will need to be supported by actions that actually enhance the value proposition.

In general, the BRIM report touches on many of the same issues as this report, but apart from the tripartite research agenda, does not lay out a clear series of action items or assign responsibilities to any actors except the funders. This is appropriate in the context of the report's scope, but it leaves important roadmapping needs unmet.

White Paper - Bringing on the Boom and Beating the Bust (April 2013)

The National Home Performance Council, Inc. (NHPC) encourages the implementation of whole-house retrofits for increased home energy performance and facilitates coordination among federal governmental agencies, utilities, state energy offices, contractors and others to achieve improved whole-house energy performance. NHPC is a registered 501(3)(c) organization. Further information about our firm can be found at www.nhpci.org.

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Appendix E:
Guidelines for Greening a Multiple Listing Service

Provided courtesy of Build It Green and as follow-up to EF California in-person comments on resources for property valuation of energy efficiency features in residences at the June 25, 2013, California Energy Commission workshop for the Draft Action Plan.

The guidelines were prepared by the Real Estate Working Group of the Retrofit Bay Area partnership under the ARRA grant, and produced by Build It Green, which facilitated the working group.

Guidelines for Greening a Multiple Listing Service

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April 16, 2012

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This guidebook was developed with the assistance and input of numerous individuals in the California real estate profession, including REALTOR® Association representatives, Multiple Listing Services representatives, REALTORS® and real estate agents, appraisers and lenders.

The guidebook is intended for use in conjunction with the National Association of REALTORS® Green MLS Toolkit and other industry available guidance for greening the MLS. It is for the purpose of identifying green and energy efficient homes and promoting voluntary efforts to recognize the value of these homes.

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Build It Green's Guidelines to Greening a Multiple Listing Service

The Intent of This Guideline

In conjunction with other national organizations, National Association of REALTORS® (NAR) has developed its Green the MLS Tool Kit (NAR Tool Kit; http://www.greenthemls.org/) which provides valuable information to assist MLS organizations in successfully developing and implementing a green MLS.

This document, *Guidelines for Greening Multiple Listing Services*, offered by Build It Green, is intended to provide guidance to the local real estate industry by providing; 1) an introduction to the NAR Green MLS Tool Kit and the value of greening the MLS; 2) highlight and comments on particular issues and "Steps" addressed in the NAR Green MLS Tool Kit, 3) a list of practical, recognizable and easy to use green data fields that reflect recognized and best green practices in California, 4) examples from MLS organizations in California and other states.

The NAR Green MLS Tool Kit is comprised of six sections or "Steps" to greening an MLS. This document addresses each Step, highlighting key elements and providing additional comments and/or recommendations specific to California. For ease, each Step has been segmented by "*NAR Green MLS Tool Kit Summary" and "Build It Green Comments and Recommendations".*

Introduction

In this era of increasing energy costs and shrinking budgets, building efficiency has become a priority for many home buyers seeking to reduce energy use and save money, and local governments seeking to create jobs. Systematic availability of information about how buildings have been designed, built, upgraded, and/or operated to a credible green standard would be a powerful tool to aid buyers, appraisers, and underwriters in recognizing buildings that meet these standards. One potentially powerful tool to help home buyers obtain green efficient homes is the Multiple Listing Service (MLS).

In the residential market, Multiple Listing Service databases are the primary data resource to inform real estate transactions. The San Francisco Association of Realtors Multiple Listing Service in 2009 became the first MLS in the Bay Area to add green label data fields to their listings. Similar efforts in Portland, Seattle, and Atlanta have each been helpful in documenting increased property value for green labeled homes. (See links in each city name.) To provide guidance on this issue, the National Association of REALTORS® (NAR) has created a web-based Green the MLS Tool Kit, which says:

> "Consumers and agents frequently ask about how much green improvements increase property values. Unfortunately, there is no way to find out because such features have not been added as searchable fields in most MLSs today. However, studies from the Pacific Northwest and data from the Atlanta MLS show that certified green homes have a clear market advantage over conventional homes. An MLS that gathers information with more accuracy becomes more valuable to the appraisers. As the green home comparable data improves, the appraiser can begin to support the value placed on other green home features such as water efficiency, materials and resources, and indoor environmental quality. As a result, they will be able to more accurately assess and place proper value on green homes."

As part of Energy Upgrade California, a federal stimulus program[1] to promote energy improvements for homes, a local Bay Area Real Estate Advisory Group has been formed, in part to support local MLS organizations in this important initiative. The advisory group and the Bay Area Energy Upgrade Team would like to support California Real Estate professionals interested in "greening the MLS," including:

- Help define green MLS fields specific to trends and programs in California
- Provide education specific to California's needs

[1] American Recovery and Reinvestment Act (ARRA)

- Provide marketing collateral
- Provide resources to track MLS green listings for further evaluation and research

Wide Benefits

The NAR Green MLS Tool Kit cites the following benefits of greening the MLS:

- "Homeowners can get credit for green features they've added. And consumers seeking green features or certifications can find such properties.
- Appraisers gain a well of data to tap for apples-to-apples comparisons and to better value green features and generate legitimate comparables.
- Green data can be aggregated to show market trends, such as time on the market, and sale-to-list price ratios for green homes versus conventionally built ones.
- Green real estate agents can use their green expertise for branding and marketing, and to establish themselves as the local go-to green agent.
- Builders can identify and deliver green features that are in demand, and they can get credit for green strategies they've implemented."

The long-term result could be a dynamic tool that not only caters to consumer and industry demands, but also something that contributes to heightening the energy efficiency of the aging, inefficient U.S. housing stock.

Overview of NAR Green MLS Tool Kit

The NAR Tool Kit has been developed over a period of several years and is a valuable and comprehensive resource of best practices in developing and implementing a Green MLS. NAR organized subject matter experts with a team of individuals that either have had direct experience with MLS systems management and/or with implementing a green MLS system. It is currently being updated with "lessons learned." Some participating organizations include the Appraisal Institute, US Green Building Council, EcoBroker® International, and the National Association of Home Builders.

The NAR Tool Kit Table of Contents illustrates the extent of information contained in the document and on the website. Additional resources and research documents linked on the website augment and expand upon concepts and guidance.

Step 1 - Cross Industry Goals & Team
- Assembling the Team
- Goals & Objectives
- Resources

Step 2 - Design for Data Integrity
- Risks
- Legal Issues
- Best Practice: MLS Board Policy - Document Attachment Requirements for Green MLS Fields
- Searchability and Statistics
- Resources

Step 3 - Design for Ongoing Quality
- Continuous Improvement Plan
- Changing Environment
- Deployment and Testing
- Maintenance
- Resources

Step 4 - Create the Green MLS Platform
- Features
- Green Features
- Building Certification
- Resources
  - Sample Field Design
    - Generic green attributes
    - Specific green features
    - Specific green features: intermingling example 1
    - Specific green features: intermingling example 2
    - Other fields
  - RESO Gets a Little Greener
  - Green Building Glossary
  - Case Studies

Step 5 - Educate, Communicate
- Education and Communication
- Promotion
- Resources
  - Case Studies

Step 6 - Track & Publish Market Trends
- Results and Review
- What Stats Should Be Tracked?
- Resources
  - Case Study

Step 1 - Cross Industry Goals & Team

NAR Green MLS Tool Kit Summary:

The NAR Green MLS Tool Kit recognizes the various stakeholder user scenarios and benefits to a good Green MLS. It therefore stresses the criticalness of including those players in its development to reflect the variety of interests. Please review and study the NAR Green MLS Tool Kit for further information on how to build a team and establish goals for your MLS.

Build It Green Comments and Recommendations:

Input for this document includes the perspective of industry professionals from the appraisal, real estate, green building and MLS industry.

Step 2 - Design for Data Integrity

NAR Green MLS Tool Kit Summary:

Step 2 of the NAR Green MLS Tool Kit addresses key issues to establish credible criteria and accurate inputs to capture short-term and long-term benefits. The section addresses risk, legal issues and strategies for design with an end result of useable statistical data on green homes and fields. There are several different steps and policies that can be implemented to mitigate such risk. Some MLS organizations, for example, require agents to upload certification documentation within four days of placing a listing. If they do not, the listing is deactivated. This practice of uploading supporting documentation not only aids in risk mitigation, it results in accurate documentation of green home market performance; ultimately establishing recognizable value through appraisal assessments.

Build It Green Comments and Recommendations:

This document has not been reviewed by a legal team at this time. However, through state and national discussions, recommendations for the deployment of "green fields" consider liability and disclosure issues confronting the real estate professional. Each MLS and its representative Association should address legal issues as necessary.

Step 3 - Design for Ongoing Quality

NAR Green MLS Tool Kit Summary:

The primary focus of this Step in the NAR Green MLS Tool Kit is the importance of the Green MLS design to address the needs of its users, particularly the real estate agent and the appraiser. Important points are; ease of use and continual improvement and updates to reflect green building technology changes. Recommendations and suggestions about deployment and maintenance are also included.

Build It Green Comments and Recommendations:

In addition to periodic review of green fields to address industry changes, the MLS organization may opt for a progressive approach to greening the platform. Step 4 below provides a list of recommended green data sets for a California MLS. However, a progression of implementation of green fields into an MLS may be a helpful strategy, keeping in mind a long term goal of providing credible comparables for determining fair market value for green homes. The compositions listed below reflect a continuum of structure with increasing capacity to establish the credibility and consistency so critical to gaining fair market value for green homes. Strategies include:

1. Green Data Sets – Incorporate verifiable and credible green certifications and features into the MLS. See Section 4 and Appendix A "Green Data Fields" of this document for recommended green data fields.
2. Supporting Documentation – As a secondary step, a requirement for supporting documentation of certifications increases accuracy and credibility for the real estate professional and their clients as well as appraisers using the information.
3. Data Integrations – Integrate data sets from regional, state and national programs that implement and produce documentation (e.g. GreenPoint Rated certificates, California Home Energy Rating, etc.). Building this capacity for this integration may take time, but will ultimately provide a high level of ease and accuracy.

Step 4 - Create the Green MLS Platform

NAR Green MLS Tool Kit Summary:

The quotes below highlight some important issues addressed in NAR Green MLS Tool Kit. A full review of this section is highly recommended.

> "In its best form, good Green MLS design reflects a set of fields that will be easily used and hard to mis-use by either traditional agents or appraisers (i.e., the agents/appraisers that do not have additional green training). The best design includes a combination of carefully selected fields and an MLS policy that requires that document attachments be included (either online or manually) to back up the data entered in the fields. This approach prevents green-washing and allows the buyer and seller to define both what is green and the value of those green features."

> "Keeping a clear separation of features that "may be green" from a direct expression of "being green" tends to offer flexibility of expression and gives a clear avenue to mitigate risk for agents and brokers."

> "It is not advisable, for instance, to automatically move existing features into a "green" field or other representation of being green. As an example, a listing agent may have identified dual pane windows as a feature of a house, never intending to claim that those windows were green or efficient. But if dual pane windows suddenly are placed in a green field because of an MLS change, it potentially changes the meaning of features in existing listings. Moreover, it could create a false statement of "green" or "efficient" that the listing agent or broker was not intending at the time of input. Thus, two separate categories of features should be developed."

Build It Green Comments and Recommendations:

Below is a list of recommended green data fields for a Green MLS in California. Green data fields were recently added to the NAR Green MLS Tool Kit webpages and may be referenced as well. As discussed in previous Steps, verification and documentation of green fields is a critical component to accuracy.

Green data fields generally fall into four categories;

- **Green Building and Energy Performance Certificates and Labels (3rd party verified)**
  - *Description:* The category of Building Certificates includes consumer labels and reports related to energy efficiency and green homes. These consumer labels and reports generally represent a more comprehensive and holistic approach look at the home from the perspective of environmental impact and reflect the home's energy and green performance on a continuum or scale of "sustainability or greenness". They are independently verified by a third-party professional and/or include a quality assurance program by the providing entity. A detailed description of each label is provided in Appendix C "Glossary of Building Certificates".

  - *Implementation into MLS Platform*: Backed by professional verification and documentation, inclusion of searchable fields into the MLS is recommended. Providing these professionally delivered certificates as searchable fields provides an ideal foundation for both marketing green homes and capturing researchable data in the quest to gain fair market value for these homes. Requiring document upload within a certain time period of claiming this field can serve in generating confidence and accuracy.

- **Green and Energy Reports**
  - *Description:* This category includes reports from home performance contractors that are not third party verified (and may or may not be subject to quality assurance by a managing entity). The category could also designate if there is a seller or builder statement / addendum of green features that may or may or may not be 3rd party verified.

  - *Implementation into MLS Platform*: Due to potentially high adoption and/or use, it is recommended that these identifications be implemented as searchable fields in an MLS platform. Home performance reports are becoming increasingly recognized as home energy upgrades gain momentum and home performance contractors meet nationally recognized credentials. MLS organizations in Colorado and Michigan have included a Seller Green Addendum as a mechanism to collect specific data about the green features in the home while reducing the risk to the real estate professional in identifying those features. See Appendix B – Best Practice Examples for Green MLS for additional information.

- **Generic Green Features**
  - *Description:* Generic Green Features are individual building features and practices that provide generically defined green building attributes in layman's terms. Examples are "Energy Efficient Construction" or "Water Conserving Landscape". A list of generic fields can be helpful in identifying homes that have not earned a label but contain green features. However, the fields may not be sufficient detailed to be helpful attributing value.

- *Implementation into MLS Platform:* The use of this category has not gained wide spread adoption in green MLS platforms, but can be a useful category for identifying homes that do not have a 3rd party verified label. They may also be helpful for a green MLS platform that does not contain Specific Green Features in its platform. An example of this category can be found in Appendix B - Best Practice Examples for Green MLS, under CRMLS in California.

- **Specific Green Features**
  - *Description*: Green Features are individual building features and practices that provide more specific information about the attributes of home apparently contributing to its "sustainability or greenness". Listing green features can be helpful in better defining the characteristics of the home and can augment information available through a green home label, both for the appraiser and a potential buyer. While associated with environmental impact on a continuum of scale, by themselves, they are not necessarily an indication of the energy efficiency or "greenness" of the home. Using the example above of dual pane windows; these windows may provide more comfort for the occupant than a single pane window but on the continuum of "greenness" do not perform as well as a "low e" window. Moreover, the evaluation of the home's overall efficiency requires a holistic view of the home beyond this single measure.

    Attributing value to individual features can be challenging unless those discrete features contribute to the identification of the home in a significant way. Categorically, features that are measureable or show quantitative quality improvements are most likely to be assigned appraised or market value and eventually may lead to demonstrated market demand.

  - *Implementation into MLS Platform:* To address risk of input accuracies and address disclosure and verification concerns, MLS organizations have generally addressed green features in two manners. Examples of these differing methodologies can be found in Appendix B "Best Practice Examples of Green MLS":
    1) Develop a "Seller Green Addendum" that has a list of green features for the seller or builder to identify. Include the "Green Addendum" as a searchable field in the MLS platform. Upload completed Green Addendum to the MLS. This document will also serve to identify homes with green features that do not have a 3rd party certificate or label.
    2) Include green features along with other home profile features without qualifying them as "green". For example, dual pane windows and low e windows would appear as available input fields in describing the characteristics of the home without defining the feature as necessarily "green". This methodology allows for the real estate professional to characterize the home without assuming qualifications as a green expert.

       For greater risk protection, the above described "Seller Green Addendum" could be used to collect green features information from the Seller or builder. The information on the "Seller Green Addendum" would be used by the agent to populate the searchable data fields on the home profile and then uploaded to the project file as supportive documentation.

Building Certifications (3rd party verification with supporting documentation)

The list below includes the Green and Energy Efficient home labels, certificates, scores and reports most recognized in California. The list is not exhaustive, thus it is recommended to include an additional field to apply to other labels that may be significant for a specific consumer base. For educational purposes, the list is separated into Energy Labels (addressing the energy component of the home only) and Green Labels (generally addressing the environmental impact areas of energy, indoor air quality, resources, water and community design).

The NAR Green MLS Tool Kit recommends that the listed Building Certificate be accompanied with: (1) Certifying Body, (2) Year of Certification, and (3) Rating Score. Document backup is strongly recommended. Please refer to the NAR Green MLS Tool Kit for additional information.

Look to Appendix C "Glossary of Building Certificates" for additional information about the certifications and the associated verifying body as well of other building certificates not referenced here.

Green and Energy Labels and Certificates (3rd party verification with supporting documentation)

- LEED for Homes (LEED-H)
- GreenPoint Rated New Home
- GreenPoint Rated Existing Home
- National Green Building Standard (NAHB)
- California Home Energy Rating Certificate (HERS Whole House)
- Department of Energy Home Energy Score (HES)
- EnergyStar Whole House Certificate
- Other_____

Green and Energy Reports (may or may not be 3rd party verified)

This category is not included in the NAR Green MLS Tool Kit at this time. As mentioned above, the home energy upgrade coupled with a home performance report is gaining traction throughout California and the nation. The Seller Green Addendum is a mechanism found in a few MLS companies around the nation to put the onus of identifying the green features onto the seller.

Green and Energy Reports / Assessments / Disclosures (may or may not include 3rd party verification)

- HERS or BPI Home Energy Audit / Assessment Report
- Seller Green Addendum

Generic Green Features

The list of generic green features is taken directly from the NAR Green MLS Tool Kit. The following features are designed to speak to the laymen who may be less knowledgeable about the specific features described in our regular feature fields. Any use of these fields should accompanying documentation or information when questioned by a potential buyer.

Energy Efficient:

- Construction
- Insulation
- Windows
- Doors
- Roofing
- Exposure/Shade
- Appliances
- HVAC
- Thermostat/Controllers
- Water Heater
- Electrical/Lighting
- Incentives & Offers

Energy Generation:

- Solar
- Wind
- Geothermal

Sustainability (Constructed with) :

- Recycled Materials
- Renewable Materials
- Recyclable Materials
- Biodegradable Materials
- Conserving Materials

Water Conservation:

- Landscaping
- Flow Control
- Reclamation

WalkScore:

_____

http://www.WalkScore.com

Specific Green Features

The list of green features and upgrades below is provided with the intention to abide by the NAR recommendations for green fields that are "easily used and hard to mis-use". As emphasized in the NAR Green MLS Tool Kit, back up documentation provides an additional level of accuracy and credibility. The list includes common and recognizable features in 1) homes that have received some level of energy efficient or green upgrade and 2) new homes built to higher energy and green performance standards.

As mentioned above, individual MLS organizations and their associated members may decide to include features as; 1) a Seller or Builder "Green Addendum or Disclosure" or 2) integrated as inputs into the list of features in the home. See Appendix B "Best Practice Examples for Green MLS" for each methodology. Local associations and industry professions can assist in making a decision about the right approach for your MLS.

Heating/Ventilation and Air Conditioning (HVAC)

- High Efficiency Furnace (equal to or greater than 90%)
- High Efficiency Air Conditioner (SEER 13 or better)
- Duct Sealing
- Properly Sized HVAC Equipment
- Programmable Thermostat
- Radiant Floor Heating
- Whole House Fan (High Velocity Attic Fan)
- Kitchen Exhaust Vented to Outside
- Bath Exhaust with Timer or Humidistat

Water Heating

- High Efficiency Water Heater (Energy Factor of 0.62 or greater)
- Tankless Water Heater

Exterior Design and Construction

- Dual Pane Windows
- Low E Windows
- Attic Insulation (R-30 or greater)
- Wall Insulation (R-13 or greater)
- Under floor Insulation (R-19 or greater)
- Air Sealing
- Recycled Content Insulation
- "Cool Roof"and/or Radiant Barrier

Solar Power

- Solar Electric (PV)
- Solar Water Heater
- Solar Heated Pool

Energy Efficient Appliances and Lighting

- Energy Star Refrigerator
- Energy Star Dishwasher
- Energy Star Clothes Washer
- High Efficiency Lighting (CFL, LED)
- Advanced Lighting Controls (sensors, timers, etc)

Lot / Landscaping / Parking / Pool

- Electric Car Hookup
- Weather Based Irrigation Controller
- Drip Irrigation System
- Drought Resistant Landscaping
- Rain Water Collection
- Greywater System

Interior Finishes

- Environmentally Preferable Flooring
- Low Emitting Flooring
- Low VOC Paint (less than 50 gr/ltr)
- Zero VOC Paint (less than 5gr/ltr)
- Low Formaldehyde Cabinets

Interior Water Conservation

- Low Flow Toilets (1.6 gal/flush)
- High Efficiency Toilet (1.28 gal/flush or Dual Flush)
- Low Flow Shower Heads (1.8 gal/min or less)
- Low Flow Kitchen Faucets (2.0 gal/min or less)
- Low Flow Bath Faucets (1.5 gal/min or less)
- Insulated Exposed Hot Water Pipes

Other

- Utility Bills Available
- Walk Score:_____ www.walkscore.com
- Transit Score:_____ www.walkscore.com/transit-score.php

Step 5 - Education and Communication

NAR Green MLS Tool Kit Summary:

Educating market actors is essential to the success of green data transparency initiatives; participants must thoroughly understand the data to be collected, how to handle such information, and how to communicate about it with appraisers, underwriters, real estate professionals, architects, engineers, contractors, owners, and others.

Step 5 of the NAR Green MLS Tool Kit states:

> "Educating members is critical to the success of a green initiative for your MLS. For other changes to the MLS data structure, you may have relied on internal training and communications processes exclusively. When greening your MLS there is assistance available for educating your members, and local and national green educators can be a great resource.
>
> "Education typically is an ongoing process and is important to the success of a green MLS. Consider providing newsletter updates, e-mail messages, or other types of communications to members as changes occur with technology and certifications. Also, place a green emphasis in your support and training materials so that existing and new members can easily stay current."

Build It Green Comments and Recommendations:

There are National and Local training opportunities for the real estate professional to obtain education about green building and about green and energy home upgrades. Green data fields are left unused in some Green MLS platforms because of the lack of user education and knowledge. Education is an ongoing process and should be encouraged at the most basic level to the most comprehensive level. Basic knowledge can enable the real estate professional to input green fields and understand proper back up documentation procedures. Real estate professionals with more comprehensive knowledge about home upgrades (especially California specific upgrade programs) become the "Source of the Source" for their clients, assisting them in finding financial and professional resources and in the decision making that can lead to saving money and living more comfortably in their home.

Below is a list of some green home training specific to the real estate professional.

National Green Home Trainings and Educational Forums

- NAR Green Designation
- EcoBroker Green Designation
- Appraisal Institute Valuation of Sustainable Building Professional Development Program

California Specific Trainings for Energy and Green Upgrades

1. Certified Green Real Estate Professional – Build It Green, http://www.builditgreen.org/training/
    - Qualifies for Level 100 of NAR Green Designation credential

Step 6 - Track and Publish Market Trends

NAR Green MLS Tool Kit Summary:

The NAR Green MLS Tool Kit not only provides Steps to Greening a MLS, it also houses many research studies on the value of green homes from regions with green MLS statistics. For instance, a study in Atlanta during 2009, showed certified green homes sold 3.6 percent closer to list price and was on the market 31 days less than conventional new construction (108 vs. 139 days). Visit the website for other research studies

Build It Green Comments and Recommendations:

Establishing market value through accurate data collection by a Green MLS is key to the advancement of energy efficient and green homes in California and across the nation. Creating and verifying demand for these homes is critical to meeting climate action goals and creating a more sustainable future for our nation. A comprehensive and track-able green data set offers a platform to research, publish and distribute quantifiable data about the value of green homes and thus is a vehicle for creating a change in public perspective and decision making.

Appendix A - Green Data Fields

The following is a suggested list of fields for a California MLS. While the method of verification of the fields may differ, professional verification and documentation will almost always lead to the highest level of accuracy and credibility. It should be noted that green and energy efficient credentials and labels entail professional verification of individual features that lead to the certificate as well as verification of the individual features.

It is recommended that supporting documentation be required for all identified 3rd party verified labels and certificates.

GREEN AND ENERGY LABELS, CERTIFICATES AND REPORTS		
Green Building Labels and Certificates (3rd party verified with supporting documentation)		
□ LEED for Homes (LEED-H)	Date:	Score:
□ GreenPoint Rated New Home	Date:	Score:
□ GreenPoint Rated Existing Home	Date:	Score:
□ National Green Building Standard (NAHB)	Date:	Score:
□ California Home Energy Rating Certificate	Date:	Score:
□ Department of Energy Home Energy Score (HES)	Date:	Score:
□ EnergyStar Whole House Certificate	Date:	Score:
□ Other _____	Date:	Score:
Green and Energy Reports / Disclosures		
□ HERS or BPI Audit / Assessment Report	Date:	
□ Seller Green Addendum / Disclosure	Date:	

GENERIC GREEN AND ENERGY FEATURES	
Energy Efficient:	□ Wind
□ Construction	□ Geothermal
□ Insulation	***Sustainability (Constructed with) :***
□ Windows	□ Recycled Materials
□ Doors	□ Recycled Materials
□ Roofing	□ Recycled Materials
□ Exposure/Shade	□ Recycled Materials
□ Appliances	□ Conserving Materials
HVAC □ Thermostat/Controllers	***Water Conservation:***
□ Water Heater	□ Landscaping
□ Electrical/Lighting	□ Flow Control
□ Incentives & Offers	□ Reclamation
Energy Generation:	***WalkScore:***
□ Solar	□ **http://www.WalkScore.com**

SPECIFIC GREEN AND ENERGY FEATURES (*Add as searchable MLS fields or as a separate uploadable Seller Green Addendum*)	
Heating/Ventilation and Air Conditioning (HVAC)	□ Energy Star Clothes Washer
□ High Efficiency Furnace (=>90%)	□ High Efficiency Lighting (CFL, LED)
□ High Efficiency Air Conditioner (SEER 13 or better)	□ Advanced Lighting Controls (sensors, timers, etc.)
□ Duct Sealing	**Lot / Landscaping / Parking / Pool**
□ Properly Sized HVAC Equipment	□ Electric Car Hookup
□ Programmable Thermostat	□ Weather Based Irrigation Controller
□ Radiant Floor Heating	□ Drip Irrigation System
□ Whole House Fan (High Velocity Attic Fan)	□ Drought Resistant Landscaping
□ Kitchen Exhaust Vented to Outside	□ Rain Water Collection
□ Bath Exhaust with Timer or Humidistat	□ Greywater System
Water Heating	**Interior Finishes**
□ High Efficiency Water Heater (Energy Factor of 0.62 or greater)	□ Environmentally Preferable Flooring
□ Tankless Water Heater	□ Low Emitting Flooring
Exterior Design and Construction	□ Low VOC Paint (less than 50 gr/ltr)
□ Dual Pane Windows	□ Zero VOC Paint (less than 5gr/ltr)
□ Low E Windows	□ Low Formaldehyde Cabinets
□ Attic Insulation (R-30 or greater)	**Interior Water Conservation**
□ Wall Insulation (R-13 or greater)	□ Low Flow Toilets (1.6 gal/flush)
□ Under floor Insulation (R-19 or greater)	□ High Efficiency Toilet (1.28 gal/flush or Dual Flush)
□ Air Sealing	□ Low Flow Shower Heads (1.8 gal/min or less)
□ Recycled Content Insulation	□ Low Flow Kitchen Faucets (2.0 gal/min or less)
□ "Cool Roof"and/or Radiant Barrier	□ Low Flow Bath Faucets (1.5 gal/min or less)
Solar Power	□ Insulated Exposed Hot Water Pipes
□ Solar Electric (PV)	**Other**
□ Solar Water Heater	□ Utility Bills Available
□ Solar Heated Pool	□ Walk Score:_____ www.WalkScore.com
Energy Efficient Appliances and Lighting	□ Transit Score:_____ www.walkscore.com/transit-score.php
□ Energy Star Refrigerator	
□ Energy Star Dishwasher	

Appendix B – Best Practice Examples for Green MLS

Included in this Appendix B are three different examples of Green MLS platforms; one from California, one from Colorado and one from Michigan. Build It Green offers these examples to assist an MLS organization and their users in making decisions and finding solutions that are best for their region. Two of these examples plus others may also be found on the NAR Green MLS toolkit website under the "Case Studies / Marketing Trends" section.

http://greenthemls.org/case-studies-market-trends.cfm

Colorado

In early 2010 the Colorado Governor's Energy Office (GEO) formed the Residential Retrofit Working Group to reduce the barriers to energy efficient building and energy retrofits for existing residential properties. As a part of the work, real estate and green professionals were convened at a statewide basis to promote appropriate standardization of terminology and data collection formats.

The Greening the MLS platform recommendations include:

1. A short list of searchable fields
    a. 3rd party certificates
    b. renewable energy sources
    c. home profile "Seller Green Addendum"
2. A separate and uploadable "Seller Green Addendum" for use by the builder or Seller to identifying specific green home features.

The recommendations are included in the following pages or can be found from the links below.

http://usgbccolorado.org/green-buildings/documents/AppraisalCommittee-MLSImprovementRecommendationsLE.pdf

http://usgbccolorado.org/green-buildings/documents/AppraisalCommittee_energyandgreenfeaturesrecommendedupdates_5_16.pdf

Michigan - Traverse Area Association of Realtors

The Traverse Area AoR developed a "Green Disclosure Statement" for identification of green and energy certificates as well as green features. The statement incorporates 3rd party certification as well as individual green features. All the data fields that appear on the Green Disclosure Statement are also searchable data fields in the MLS. The agent uses the Green Disclosure Statement to populate the project profile and uploads the Statement to the project file.

The Greening the MLS platform includes:

1. A separate and uploadable "Green Disclosure Statement" for use by the builder or Seller to identifying specific green home features.
2. A searchable field that identifies the home as an "eco-friendly" friendly homes
3. Searchable fields that match the features listed in the "Green Disclosure Statement"

Traverse requires document back up with any claimed 3rd party verified green or energy certificate.

A copy of the "Green Disclosure Statement" is included in the following pages and can be found in its entirety at the link below.

http://greenthemls.org/pdfs/CaseStudy-TraverseCity.pdf

California - CRMLS

CRMLS is one of the largest MLS platforms in California. The platform closely matches the Green MLS Platform section in the NAR Green MSL Tool Kit, both in format and in the listed data fields.

The Greening the MLS platform includes:

2. Searchable Green Certifications
3. Searchable Green Marketing (Generic) Features"
4. Searchable home profile data fields that may be recognized as "green" but are embedded with other home profile features without a "green" identification or highlight.

A copy of the data input fields are included in the following pages or can be found in their entirety at the link below.

http://www.imrmls.com/help/input_forms/form1_res_1121.pdf

Appendix C – Glossary of Building Certificates

The following list of labels and certificates are ones prominent in California. The list contain programs that address some or all of the primary environmental impact areas noted in residential construction; energy efficiency, indoor air quality, resource conservation, water conservation and community design. Some are designed for use primarily for newly constructed homes only, some address existing homes only and some address both.

The Appendix is organized by the most comprehensive labels (green labels), followed by those that address only some of the environmental impact areas (energy, water, indoor air quality).

Green and Energy Labels and Certificates

1. Leadership in Energy and Environmental Design (LEED)

Addresses: New Homes and Gut Remodels - all environmental categories

Program Summary

LEED has certifications available for residential, commercial and retail construction. LEED for Homes (LEED-H) is a third-party-verified, voluntary rating system that promotes the design and construction of high-performance green homes. LEED for Neighborhood Developments (LEED-ND) integrates the principles of smart growth, urbanism, and green building into the first national system for neighborhood design. LEED points are awarded on a 100-point scale, and credits are weighted to reflect their potential environmental impacts with 10 bonus credits available, four of which address regionally specific environmental issues. A project must satisfy all prerequisites and earn a minimum number of points to be certified.

Program Development

Developed by the U.S. Green Building Council (USGBC), LEED promotes a whole-building approach to sustainability by recognizing performance in key areas including water efficiency, energy and atmosphere, location and linkages, awareness and education and others.

Program Manager

The Green Building Certification Institute (GBCI) assumes administration of LEED certification for projects registered under any LEED rating system.

Verification

The Green Building Certification Institute (GBCI) was established by USGBC to provide a series of exams to allow individuals to become accredited for their knowledge of the LEED rating system as LEED Accredited Professionals (LEED AP) or LEED Green Associates. GBCI also provides third-party certification for projects pursuing LEED. LEED Green Associates and LEED APs (Accredited Professionals) verify that green building practices have been met for certification. LEED certification is an independent, third-party verification process that confirms a development's location and design meets accepted high levels of environmentally responsible, sustainable development.

Resources

GBCI LEED Certification
http://www.gbci.org/main-nav/building-certification/leed-certification.aspx
LEED-H
http://www.usgbc.org/DisplayPage.aspx?CMSPageID=147
LEED-ND
http://www.usgbc.org/DisplayPage.aspx?CMSPageID=148

2. GreenPoint Rated New Homes

Addresses: New Homes and Gut Remodels - all environmental categories

Program Summary

The GreenPoint Rated program is a rating system for residential properties that recognizes innovation in indoor air quality, resource conservation, energy and water conservation and community design. The program exists for new and existing single family and multifamily homes. In order to receive certification, a home must meet minimum point requirements in five categories, score a total of at least 50 points and use a minimum of 15-percent less energy than a conventional home.

The program has seen wide participation in California with 10,000 completed homes by the end of 2011

Program Development

The program uses nationally and regionally recognized standards and is developed by Build It Green in cooperation with California agencies, experts and stakeholders.

Program Manager

Build It Green, a membership supported non-profit organization whose mission is to promote healthy, energy and resource efficient homes in California, certifies GreenPoint Rated homes and trains GreenPoint Raters.

Verification

GreenPoint Raters are professionals trained in green home design who verify that homes pursuing GreenPoint Rated certification meet the minimum requirements for acknowledgement. GreenPoint Rated certified homes are third party verified to meet the unique array of green practices chosen by the builder or owner from the GreenPoint Rated checklist of green building measures for residential homes. GreenPoint Rated homes are environmentally friendly, save resources and money, and can be healthier and more comfortable than conventional homes.

Resources:

The GreenPoint Rated Program
http://www.builditgreen.org/greenpoint-rated/

3. GreenPoint Rated Existing Homes

Addresses: Existing Homes - all environmental categories

Program Summary

The GreenPoint Rated program is a rating system for residential properties that recognizes environmental benefit in indoor air quality, resource conservation, energy and water conservation and community design. The program exists for new and existing single family and multifamily homes. Qualification for the label requires points in the environmental categories and an overall point threshold. The Existing Home program contains two tiers; the Elements label, requiring an over 25 points and the Whole House label, requiring an overall 50 points and a minimum energy performance based on the home vintage.

Program Development

The program uses nationally and regionally recognized standards and is developed by Build It Green with diverse stakeholder input, including California agencies and utilities, experts and building industry professionals.

Program Manager

Build It Green is a membership supported non-profit organization whose mission is to promote healthy, energy and resource efficient homes in California. They manage the GreenPoint Rated program and train, certify and quality assure the GreenPoint Raters.

Verification
GreenPoint Raters are professionals trained in green home design who verify that homes pursuing GreenPoint Rated certification meet the minimum requirements for acknowledgement, based upon fully developed and vetted criteria for each measure. GreenPoint Rater Existing Home may be a third party independent consultant or a professional (contractor or designer) who is on the construction team. The "contractor delivery" pathway is accompanied by an enhanced quality assurance by Build It Green and models national standards of Building Performance Institute.

Resources:
The GreenPoint Rated Program
http://www.greenpointrated.com

4. National Home Builders Association and ICC 700 National Green Building Standard™ (NAHB)
Addresses: New Homes - all environmental categories

Program Summary
The ICC 700 National Green Building Standard™ is a residential green building rating system that defines green building for single and multifamily homes and residential remodeling projects. For residential buildings, four threshold levels — Bronze, Silver, Gold, and Emerald — allow builders to quantify and qualify green building at all levels. At the Emerald level, the highest rating for a residential green building, a building must incorporate energy savings of 60-percent or more over the International Residential Code. To comply with the Standard, a builder or remodeler must incorporate a minimum number of features in the following areas: lot and site development; energy, water, and resource efficiency; indoor environmental quality; and home owner education.

Program Development
The program was developed using a full consensus process and receive approval from the American National Standards Institute (ANSI). The Standard defines green building for single and multifamily homes, residential remodeling projects, and site development projects.

Program Manager
The National Association of Home Builders (NAHB) and the International Code Council (ICC) partnered to establish a nationally-recognizable standard definition of green building.

Verification
NAHB Research Center also certifies green verifiers to complete the third party review and to complete the building certification process.

Resources
ICC 700 National Green Building Standard Home
http://www.nahbgreen.org/NGBS/default.aspx

5. Home Energy Rating System Certificate (HERS Whole House)
Addresses: Existing Homes and New Homes – Energy Performance

Program Summary
The goal of the Home Energy Rating System (HERS) program is to provide reliable information to differentiate the energy efficiency levels among California homes and to guide investment in cost-effective home energy efficiency measures. Additional amendments adopted in 2010 included the requirements for California Whole-House Energy Ratings ("Phase II") of the HERS regulations to expand the program. HERS II now includes energy efficiency ratings for existing and newly constructed residential buildings that include single family homes and multifamily buildings of three stories or less. The HERS II "California Whole-House Home Energy Rating" is designed to:

- Estimate and compare home energy efficiency
- Identifying energy-saving improvements

- Calculate a California Home Energy Rating (Score) and Certificate

Program Development
The California Public Resources Code (PRC) Section 25942 directs the Energy Commission to adopt a statewide California Home Energy Rating System (HERS) Program for residential dwellings.

Program Manager
HERS Providers oversee HERS Raters providing 2008 Title 24, Part 6 Field Verification and Diagnostic Testing services. The California Energy Commission approves and oversees HERS Providers. The California Certified Energy Rating & Testing Services (CalCERTS) is currently the only approved HERS Providers. Two other providers, the California Building Performance Contractors Association (CBPCA), and the California Home Energy Efficiency Rating System (CHEERS) are expected to be approved for service.

Verification
The California Energy Commission developed a process for certifying HERS II Raters who perform third-party inspections and diagnostic testing of existing homes and deliver a California Home Energy Rating Score and Certificate. The Rater performs an audit that evaluates the performance of the energy-related components of the home (e.g., insulation, windows, heating/cooling system, ducts, water heating, and appliances). The Rater conducts a comprehensive analysis of the home's energy use using data collected from the audit in state-approved software applications.

Resources
HERS Program Description
http://www.energy.ca.gov/HERS/index.html

6. Department of Energy - Home Energy Score (HES)
Addresses: New Homes – Energy Performance

Program Summary
The Department of Energy (DOE) has developed a voluntary National Energy Rating Program for Homes with the focus on existing homes. The Home Energy Score allows a homeowner to compare her or his home's energy consumption to that of other homes, similar to a vehicle's mile-per-gallon rating. A home energy assessor will collect energy information during a brief home walk-through and then score that home on a scale of 1 to 10. A 10 would represent a home with excellent energy performance whereas a 1 would represent a home that needs extensive energy improvements or energy upgrades. The home energy assessor will provide the homeowner with a list of recommended energy improvements and the associated cost savings estimates as well as the Home Energy Score label.
The Department of Energy (DOE) is in the process of developing a voluntary National Energy Rating Program for Homes with the focus on existing homes. The purpose is to develop a credible method for evaluating a home's performance and make recommendations on how to improve the performance of a home. This information will allow consumers to compare homes and will provide lenders with information on how to finance energy improvements.

Program Development
In fall 2009, the Vice President and White House Council on Environmental Quality called on the U.S. Department of Energy (DOE) to create a system by which a homeowner could easily and affordably find out how their home's energy performance compares with other homes in the same area. In response, after a year of consumer and expert research and development, DOE is pleased to launch the Home Energy Score.

Program Manager
The Home Energy Score is administered by the U.S. Department of Energy

Verification
In order to use the Home Energy Scoring Tool and generate a Home Energy Score, a qualified assessor must meet the following requirements:

- Be certified by the Building Performance Institute (BPI) or by a Residential Energy Services Network (RESNET) Provider, and
- Complete and receive a passing grade on DOE's Home Energy Scoring Tool online training module and test.

Resources
http://www1.eere.energy.gov/buildings/homeenergyscore/

7. ENERGY STAR® Whole House Certificate
Addresses: New Homes – Energy Performance

Program Summary
The ENERGY STAR® program aims to help homeowners save money and protect the environment through energy efficient products and practices. To earn the ENERGY STAR® certification a home must meet strict guidelines for energy efficiency set by the U.S. Environmental Protection Agency. These homes are at least 15-percent more energy efficient than homes built to the 2004 International Residential Code (IRC), and include additional energy-saving features that typically make them 20–30-percent more efficient than standard homes. In California, the homes are15-percent more energy efficient than homes built to the California Title 24 Energy Code.

Program Development
The Environmental Protection Agency developed the ENERGY STAR® by drafting specifications for products, considering stakeholder comments, and conducting EPA presentations and data analyses on home energy use.

Program Manager
The ENERGY STAR® program is a joint program between the U.S. Environmental Protection Agency and the U.S. Department of Energy.

Verification
To ensure that a home meets ENERGY STAR® guidelines, third-party verification by a certified Home Energy Rater (or equivalent) is required. Trained Raters work closely with builders throughout the construction process to help determine the needed energy saving equipment and construction techniques for the home and conduct required on-site diagnostic testing and inspections to document that the home is eligible to earn the ENERGY STAR® label.

Resources
How New Homes Earn EnergyStar®
http://www.energystar.gov/index.cfm?c=new_homes.nh_verification_process

Green and Energy Reports / Disclosures

1. Whole House Energy Report
Addresses: All Homes – Energy Performance

Program Summary
The Whole House Energy Report is a report based on a comprehensive "whole house" review, including a field inspection and diagnostic testing of the home, completed by a trained and certified Building Performance Contractor. The insulation values of the home are assessed (windows, insulation, exterior sheathing, roofing, etc) as well as the tightness of the envelope. The HVAC equipment and air delivery system is inspected and tested for efficiency and tightness.

A Whole House report is associated with two programs in California:

- Energy Upgrade California – a utility rebate program offering rebates to homeowners to upgrade their home. See https://energyupgradeca.org
- California's Home Energy Rating System Certificate – See Section #5 above

Program Development
The Energy Upgrade California utility rebate program was developed by the state's major utilities (PG+E, So Cal Edison, So Cal Gas, San Diego Gas and Electric), although some municipal utilities have similar programs. Some local governments also have rebates for green and energy upgrades.

The program uses professionally trained Building Performance Contractors, meeting national standards of the Building Performance Institute (BPI). Data collected from the home is entered into a software program that calculates the home's performance. Rebates are based upon a percent improvement in the home. The BPI standard also includes a test for combustion safety of the home.

BPI standards have developed over time as building science knowledge has advanced. Standards for energy audits and assessments are very well established and quite consistent throughout the country. The software programs designed to calculate the home performance are also well developed, but do vary regionally.

Program Manager
The major utilities are responsible for implementation and quality assurance for the Energy Upgrade California program. The Building Performance Institute (BPI) is a nationally based non-profit organization. They approve BPI Affiliates who provide training, testing credentials and quality assurance to BPI contractors.

Verification
Quality assurance programs are instituted and conducted by the program managers.

Resources
Energy Upgrade California (EUC) - www.energyupgradeca.org
The Building Performance Institute (BPI)

2. **Seller Green Addendum / Disclosure**
Addresses: All Homes

Program Summary
Some MLS organizations have opted to develop a "Seller Green Addendum" for use by the builder or Seller to identifying specific green home features. The addendum lists the green fields in the MLS platform and is filed out and signed by the homeowner or builder. The agent can then input into the green fields using the identified fields. The Addendum can also be uploaded to the project file. This option provides a level of risk mitigation to the agent in identifying green fields.

Program Manager
The individual MLS organization sets the parameters for the Addendum.

Verification
Risk of verification is assumed by the Seller

Other "Whole House" Labels

1. **LEED Neighborhood Development -** http://www.usgbc.org/DisplayPage.aspx?CMSPageID=148
2. **Enterprise Green Communities -** http://www.greencommunitiesonline.org/
3. **Passive House -** http://www.passivehouse.us/passiveHouse/PHIUSHome.html
4. **Living Building Challenge -** https://ilbi.org/lbc

5. WaterSense

Addresses: New Homes – Water Conservation

Program Summary

The WaterSense certification is available for single-family new homes that are built to use 20-percent less water than conventional new homes. In order to earn the label, homes must feature WaterSense labeled plumbing fixtures, efficient hot water delivery systems, and landscaped areas designed with water savings in mind. Clothes washers and dishwashers must be ENERGY STAR® qualified models, and irrigation systems must be designed or installed and audited by WaterSense irrigation partners. WaterSense labeled homes should save homeowners at least 10,000 gallons of water per year, enough to fill a backyard swimming pool and also realize energy efficiency from heating less water. Combined, these savings help homeowners reduce their utility bills by at least $100 to $200 per year.

Program Development

WaterSense spent more than three years working with hundreds of builders, utilities, trade associations, manufacturers, landscape and irrigation professionals, and certification providers to develop efficiency and performance criteria for water efficient new homes. The Environmental Protection Agency (EPA) drafted two versions of the specification for public comment, developed a certification system, and conducted dozens of meetings with key stakeholders before it finalized the specification.

Program Manager

WaterSense is an EPA-sponsored program that partnered with irrigation professionals and other irrigation certification programs to promote water efficient landscape irrigation practices.

Verification

WaterSense irrigation partners are certified auditors that perform irrigation services in the city, county, or metropolitan area where the home is being built.

Resources

WaterSense Pilot Program
http://www.epa.gov/WaterSense/spaces/home_pilot.html

6. Indoor airPLUS for New Homes

Addresses: New Homes – Indoor Air Quality

Program Summary

The Indoor airPLUS certification helps builders meet the growing consumer preference for homes with improved indoor air quality. The program is available for new homes built with energy efficiency and improved indoor air quality in mind. In order to receive the Indoor airPLUS label, a builder must first design a home to earn the ENERGY STAR® certification for new homes. The builder then adds up to 30 home design and construction features to help protect qualified homes from moisture and mold, pests, combustion gases, and other airborne pollutants. Construction specifications include the careful selection of and installation of moisture control systems including heating, ventilating, and air-conditioning (HVAC) systems, combustion-venting systems, radon resistant construction, and low-emitting building materials.

Program Development

Together, Indoor airPLUS, builders, home energy raters and providers, and public and private organizations worked together to promote indoor air quality in new homes as an easy and desirable option for homebuyers to help protect their health and the environment.

Program Manager

The EPA created the Indoor airPLUS program to help builders meet the growing consumer preference for homes with improved indoor air quality.

Verification

Before the home can officially earn the Indoor airPLUS label, it is inspected by an independent third-party to ensure compliance with EPA's rigorous guidelines and specifications.

Resources

Indoor airPLUS Program Information
http://www.epa.gov/indoorairplus/

About Build It Green

Build It Green is a membership supported non-profit organization whose mission is to promote healthy, energy- and resource-efficient homes in California.

Established in 2003, we offer a comprehensive package of support to the residential building sector through professional training, ongoing professional guilds and councils, green product marketing and reasonable policy initiatives. Its consumer brand for green homes, GreenPoint Rated, is known for its credible yet accessible standards and has reached a milestone of 10,000 homes completed in California.

Build It Green fosters stakeholder alliances to develop strategies, incubate and implement programs that help to establish California as a role model to other states and the nation for developing pragmatic solutions to environmental challenges. We strive to design our programs to have wide-reaching market-based impacts that can positively impact many Californians.

To foster collaboration and accelerate the adoption of green building practices, Build It Green provides a network of councils to bring together stakeholders from key building industries. The councils facilitate learning, encourage advocacy, grow leadership skills, and leverage the capacity of individuals and organizations en masse to work toward mutually beneficial goals. The councils also multiply the impacts of our other programs.
For more information, visit our website at www.BuildItGreen.org.

Build It GREEN™
Smart Solutions from the Ground Up

GreenPointRATED™
A PROGRAM OF BUILD IT GREEN