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California Energy Commission

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Memo

To: California Energy Commission Docket
From: Bruce Mast, Director of Business Development, Build It Green
Date: 10/23/2012
Re: Build It Green comments on Comprehensive Energy Efficiency Program for Existing Buildings (AB 758) Scoping Report (docket number 12-EBP-1)

Introduction

Build It Green salutes the California Energy Commission for its development of a comprehensive and thoughtful Scoping Report. This report incorporates decades of policy development and practical lessons learned to establish a solid basis for developing a comprehensive energy efficiency program for existing buildings, pursuant to AB 758.

There is much to like in this report and our attempt to enumerate all the good points would quickly produce an unwieldy response. Rather than attempt to provide comprehensive comments on the entire Scoping Report, this response will focus more narrowly on the specific question:

Under what conditions would it be appropriate to include an energy rating in an upgrade project?

Market Applications for Energy Ratings

The Scoping Report appropriately recognizes that the vast majority of residential upgrades needed to satisfy state policy objectives must necessarily come from voluntary transactions between property owners and contractors. The Scoping Report, on page ix of the Executive Summary, acknowledges that “it is contractors who must drive the retrofit marketplace.” In addition, the Scoping Report states that the various entities involved in supporting the retrofit marketplace “must be aligned and committed to the best interests of the upgrade customer.”

Page 49 of the Scoping Report properly differentiates the applicability of asset ratings versus energy use (i.e. operational) ratings:

Asset ratings are particularly useful for consideration about valuing property, either in monetary terms or in terms of its expected utility or performance with respect to a financial transaction (sale, lease, financing). Energy use ratings can be useful for giving building owners or operators' feedback on their building or their operational practices.

...

The Scoping Report properly identifies real estate transactions as a market trigger point that benefits from an asset rating. Whether shopping for a new or existing home, the buyer is faced with the task of evaluating and comparing multiple prospective purchases, necessitating a rating system to compare the energy performance of those homes. Moreover, rating results based on standard operating assumptions provide the appropriate comparison because actual operating patterns either do not exist (for new homes) or do not apply going forward (for existing homes). The Scoping Report rightly acknowledges financial transactions as the key trigger point for asset ratings, while noting that waiting until time of sale to perform the rating introduces certain practical challenges.

Applying an asset rating to an "elective upgrade" brings its own set of challenges, starting with reliance on the more abstract asset rating instead of the more specific energy use rating. In the elective upgrade scenario, there is no change of occupancy contemplated and the best available information about future operating patterns is the occupant's historic operating patterns. Furthermore, while comparison to other homes may be of intellectual interest, the more important comparison is the home's forecast post-retrofit performance relative to its actual pre-retrofit performance. The best predictor of future benefits to the occupant would thus appear to be an energy use rating.

One must seriously consider whether a voluntary upgrade program with an asset rating requirement adequately reflects the need to be aligned and committed to the best interests of the upgrade customer. An important symptom that the HERS rating system may not be sufficiently aligned with the needs of the elective upgrade market is the widespread contractor resistance to rating their jobs or using the energy modeling software for any purpose except rebate program compliance. Anecdotal evidence indicates that contractors do not appear to use the HERS Rating or the underlying model results to help sell jobs despite the substantial investment in EnergyPro modeling software to determine cost effectiveness of energy efficiency measures and develop recommendations for improvements. While this finding merits further research to validate and explain, it appears a basic reason may be that model results based on typical operating patterns and installation costs do not adequately reflect actual costs and benefits for a particular work scope for a particular home and a particular occupant, as performed by a particular contractor. Too often, the model results must be explained away, which hurts rather than helps the sale. In short, the Scoping Report assertion that "Ratings can...motivate consumers to take action on an upgrade project" (p. 48) remains to be demonstrated.

The challenges of integrating asset ratings into elective upgrades are numerous, as discussed in the Scoping Report's review of the various ARRA-funded programs. Challenges include

- Low conversion rates from independent, third-party ratings to upgrades
- Multiple customer "touches" that drive up both price and transaction costs for the customer

- Multiple confusing and conflicting recommendations from different assessments, despite the reliance on generally uniform assessment protocols and energy modeling software
- General inability of HERS Raters to prepare cost estimates suitable for contractor bid documents

Options for integrating HERS Asset Rating into Elective Upgrades

Perhaps the most realistic integration point for delivering ratings as part of an elective upgrade is through the installation contractor. In developing the HERS regulations, the Commission has recognized this opportunity via establishment of the Building Performance Contractor (BPC) pathway. However, it must be recognized that even this pathway, as currently specified, involves significant upfront investment on the contractor's part, significant added costs per job, and limited immediate value to the property owner.

The Scoping Report also calls out the quality assurance process as a potential integration point. This proposal has merit but requires much more thought than merely specifying that HERS ratings shall double as quality assurance visits. Program design must recognize that the multiple touch issue is a thorny one, resolvable only by recognizing multiple consumers of QA results, each with their individual needs. For example, BPI and utility programs place a high priority on verifying combustion appliance safety results, which is not currently part of a standard HERS rating. The rating process itself would need to be transparent to all users of the results: contractor and job sampling, scheduling for future inspections, test results from past inspections, corrective actions taken, adherence to customer service standards by the HERS raters, etc., etc. These results would need to be available in real time to BPI, rebate program administrators, lenders, green labeling programs that piggy-back on the HERS result, etc.

Policy Rationale for Public Investments Tied to Asset Ratings

Despite numerous challenges to integrate asset ratings into the elective upgrade process—challenges the Scoping Report explicitly acknowledges—the Report appears to frame the issue in terms that will justify doing exactly that. Most tellingly, page 62 provides nearly a full page of narrative to rationalize linking public investments to asset ratings. The assumptions underlying this rationale should be carefully scrutinized.

The public policy rationale assumes that a portfolio of upgrades based on asset ratings will produce materially different results than a portfolio based on energy use ratings. If the asset rating methodology is based on typical operating behavior, then one would expect the average asset rating to converge on the average energy use rating when the averages are calculated over a large portfolio of improvements. If the two averages do not converge, then the appropriate response would be to scrutinize the input assumptions defining “typical operating behavior”. In short, resource planners should be able to be agnostic as to whether results are asset-based or operational-based.

The public policy rationale further assumes that cost-effectiveness tests should be applied on a house by house basis. This assumption is implicit in the statement concerning the need to “avoid perverse, potentially unfair use of public funds to support or deny support for particular energy efficiency measures in individual homes.” In practice, Energy Upgrade California does not require project-level cost-effectiveness and it should not, given our current inability to

properly value non-energy benefits. Furthermore, asset rating or no asset rating, it is impractical to impose project-specific tests for whether particular customers are “wasteful in their energy use”, “affluent enough to pay the energy bills”, or properly deserving of public investments.

The public policy rationale further implies that publicly funded programs (and by extension, participating contractors) should encourage members of the public to invest in energy efficiency solely for public benefit, even if those investments run contrary to their own self-interests. As an absurd example, reliance on an asset rating based on typical operating behavior would suggest that energy upgrade investments are warranted even in a vacation home that is occupied only a couple months a year. This approach runs counter to the mantra that voluntary programs “must be aligned and committed to the best interests of the upgrade customer.” Experience suggests that contractors and home owners will not obediently prioritize public benefits over private benefits when the two diverge. Rather, they will ignore the public benefit recommendations and attribute lower credibility to its proponents.

The public policy rationale further assumes that the use of standard occupant assumptions will be easier to administer than individualized occupant assumptions. This belief ignores the fact that engineering models of energy performance can only be calibrated to energy bills using individualized occupant assumptions. BPI Standard 2400 is explicit on this point. Only *after* properly calibrating to actual occupancy patterns can “typical” occupancy patterns be substituted to derive an asset rating result. In short, an asset rating necessarily requires an energy use rating calculation as an intermediate step, making the asset rating at least as challenging to administer, if not more so.

Finally, the public policy rationale and the Scoping Report as a whole shed little light on the issue of rating cost. This issue deserves thoughtful analysis. A back-of-the-envelope calculation suggests that the objective of developing a HERS asset rating for every single-family home in California would require a \$3 billion investment before we even start investing in upgrades.¹ This price tag puts the Commission in the difficult position of fundraising the \$3 billion (unlikely in the current political and economic climate) or imposing the cost on private sector actors who may not directly benefit from the investment. The time frame for accomplishing such an investment is unknown but it is probably long.

Recommendation for Next Steps

Build It Green recommends that the Commission exercise its legislative authority to establish a rating system framework that offers flexible solutions to different market needs. Some market trigger events clearly need asset ratings to inform decision-making; others need energy use ratings or assessments. Some events require investment-grade audits; others need only simple benchmarking analysis. The current system of relying on a single asset rating system tied to performance relative to state building standards has proven unwieldy, data intensive, complicated for practitioners, and expensive.

As an alternative method that builds on, rather than replaces the current system, Build It Green proposes that the Commission adopt as its single statewide scale an EUI-based percentile ranking system that expresses a home’s Energy Use Intensity (EUI, reported as weather normalized BTU/sq. ft.) as a percentile ranking relative to the universe of home EUI

¹ Estimated as \$500 per HERS rating for 6 million single-family homes

values in the same climate zone. This system offers several advantages, starting with flexibility. An EUI ranking system can accommodate multiple analysis tools, tailored to different applications, as long as those tools are capable of reporting results in weather normalized whole-house BTU / sq. ft. The toolkit can include tools for asset ratings, energy use ratings, building standards compliance, building assessments, investment-grade audits, utility bill disaggregation, consumer-focused what-if analysis, etc.

A direct consequence of this added flexibility is that the current HERS Rater / EnergyPro modeling approach can be maintained for demonstrating building standards compliance without requiring the same system to address every other rating system challenge. In addition to the menu of building simulation outputs currently available, building-specific EUI can easily be added to the menu, which in turn can be related to performance of the entire housing stock in that climate zone. Home buyers will be able to see how much better their new home performs relative to the building standards AND relative to all the other homes already in existence.

Build It Green believes a second benefit will be the consumers' intuitive ease of understanding a percentile ranking system. The existing housing stock offers a relatively concrete reference point for understanding a particular home's energy performance, whereas the building standards are an opaque abstraction for many consumers. Again, switching to the percentile ranking method does not preclude the use of other metrics as long as those tools can also translate their results into an EUI and then a percentile rank.

A third benefit is expected to be the relatively low cost for initial deployment. While it may be desirable over the long term to derive EUIs from rigorous utility bill-calibrated asset ratings based on detailed site data, the system can initially be seeded with an operational EUI based only on the home's utility bill history, zip code, and square footage.² While admittedly less rigorous than a site-specific asset rating, the compromise in analysis rigor should be more than offset by reduced deployment costs and speed to market. For most home occupants whose operational patterns are reasonably "typical", this operational-based ranking would presumably produce results that are comparable to more rigorous asset rating procedures. There would of course be outliers but the negative consequences could be mitigated by offering a mechanism for HERS raters to substitute asset ratings as those results become available.

A fourth benefit is that initial deployment using default operational rating calculations offers the potential to launch a system starting on Day 1 with a non-missing energy rating value for virtually every address in the state. This advantage should greatly accelerate market adoption. It means that the Commission can decouple the demand creation task from the supply fulfillment task. The current rating system has an inherent "chicken and egg" problem with supply and demand that impedes market uptake. Establishing non-missing default values across the board also enables the Commission to decouple asset rating delivery and rating disclosures. It means the Commission can consider time of sale disclosure requirements without getting mired in concerns about audit expense and transaction costs that potentially complicate the sale.

² The biggest impediment to this approach is likely to be resolution of customer privacy concerns with the CPUC and the utilities. Without getting too deep into implementation details at this point, Build It Green believes customer privacy can be adequately safeguarded within the proposed framework.

Clearly, significant work remains to be done to develop this idea into a workable plan and vet it with the numerous interests that have a stake in the outcome. Build It Green looks forward to further dialogue with the Commission and fellow stakeholders who are committed to developing a robust and market-friendly rating system that responds directly to market needs for clearly communicated energy performance information.