

## CEC Home Energy Ratings - Comments by Efficiency First California

We are writing to express a number of concerns about the California Energy Commission's proposal to establish asset ratings on all residential buildings, and to provide a proposal for a sustainable and reasonable way forward to achieve the State's goals.

The regulation that the CEC is attempting to comply with is very clear. It calls for a consistent, accurate, single statewide rating scale, with the ability to estimate utility bill savings, and provide reliable recommendations on upgrades.

Efficiency First strongly contends that while these may be noble goals, we have proven over the last 10 years that it is not possible to achieve.

This regulation allows for only a single labeling approach for all sectors. Efficiency First understands the desire of new home builders to use the National RESNET system, however this system is not appropriate for existing buildings. This regulation does not allow the CEC to create a bifurcated pathway whereby new homes might use RESNET HERS, while existing uses HES (as an example).

We would also contend that there are numerous studies that call into question the "consistency" and "accuracy" of these scores. In other cases, such as the Home Energy Score, there are few available studies to draw from that compare predicted outcomes or scores to real bills.

Experience has demonstrated that asset rating tools do not produce reasonable estimates of utility bill savings, and are not able to produce reliable recommendations. This has been proven time and time again in CA and across the country. One need only talk to contractors in CA where the HERSII approach was tested (Sonoma for example) to determine that recommendations generated from an engineering model have little to do with actionable or accurate work scopes. These faulty model driven scopes actually become a barrier to getting real work done as customers lose confidence in contractors who contradict the software driven results of raters.

The proposal to separate asset ratings from assessment software makes sense, in that the CEC clearly recognizes that asset tools are neither accurate or able to produce work scopes. The CEC and regulators in general, do not have a good track record regulating energy prediction tools. These tools are closely aligned with business models and there are several different methods competing in the marketplace. We believe that the current CalTRACK process, which the CEC was involved in, is the correct approach and that assessment tools should be governed based entirely on the proven (with billing analysis) accuracy of their results - no regulation needed.

We also do not believe that regulation driving this proceeding allows for bifurcation, and specifically calls for a single system that pertains only to a “rating scale,” not assessment software.

Public Resource Code section 25942  
Division 15. Energy Conservation and Development  
Chapter 10.8. Home Energy and Labeling Program

(a) On or before July 1, 1995, the commission shall establish criteria for adopting a statewide home energy rating program for residential dwellings. The program criteria shall include, but are not limited to, all of the following elements:

- (1) Consistent, accurate, and uniform ratings based on a single statewide rating scale.
- (2) Reasonable estimates of potential utility bill savings, and reliable recommendations on cost-effective measures to improve energy efficiency.

## HERSII

HERSII represents an expensive and complex system to deliver ratings that have significant accuracy issues, don't work for industry, and provide little benefit to consumers. Implementing a system that creates inaccurate ratings has the potential to negatively affect property values and discourage energy savings. Scaling up such an approach is not only unfounded but unwise, and is may to result in the opposite of its intended effect. Consumers, industry and the public interest would be much better served by a market-driven energy efficiency policy that rewards real, measured savings rather than relying on complex, inaccurate and outdated models.

Recent pilot programs along with [numerous studies](#) have shown that it is difficult to get accurate and repeatable results when using energy modeling software to generate asset ratings for existing buildings. The studies revealed that because simulation models use a variety of assumptions in their calculations, they also produce a wide range of results depending of which methodology is used. Human error contributes to the unreliability of a model-based approach, due to the complicated data collection and input process, which is complex, labor intensive, and produces less than accurate results.

Rating systems are often compared to the Miles Per Gallon system used by the automobile industry. This comparison, however, is misleading at best. Unlike vehicle MPG ratings, which are determined in laboratory settings by highly trained, government-certified third parties, using standardized testing methods and tools, home energy performance data is not collected in a controlled environment. Variations in test conditions, construction type, and building condition all influence the results and related score. And the proposed home asset rating system is far more complex than the automotive MPG standard.

MPG ratings for automobiles are provided with two figures, one for city driving conditions and the other for freeway driving conditions, along with a disclaimer that

“actual mileage will vary”. In most cases the actual mileage will be lower due to the multitude of factors affecting performance outside the controlled laboratory environment.

Some significant challenges involved in generating a meaningful energy rating ratings score include:

1. Data collection is measured by individuals with a wide range of experience. This data is then is used to generate energy predictions. It is true that the HERSII raters who perform audits and collect data must be certified as HERS Whole Home Raters. Certification trainings are typically are 16 days long with classroom and field training. However, the experience of the rater who is collecting data to produce the HERSII score may range from 30 years of general contracting experience to someone fresh out of High School. Lack of construction trade experience impacts the accuracy of the data collected.
2. Variance in the tools used for the data collection. The performance of tools used to collect data in the field varies. Assumptions used by equipment manufacturers in the design of their products can lead to inaccurately gathered information in the field. It is possible to generate significantly different readings from two different brands of the same test instrument while connected to a common reference source.
3. The fact that data is not collected in a controlled laboratory environment. There are many complex interactions effecting energy use in a home. Temperature, humidity, wind and many other factors impact the accuracy of data. It is not uncommon to perform the same test on a home on two different occasions with significantly different results due to external conditions.
4. Differences between new homes and existing buildings. Unlike MPG ratings, which do not apply to used vehicles, a single home energy score is trying to create a rating system that applies to both new homes and existing buildings. A vehicle’s performance can be significantly altered as the vehicle ages. Maintenance, modifications, and general wear all effect the performance and thereby the miles per gallon rating of the vehicle. The automobile industry recognizes this potential and does attempt to create MPG ratings for used vehicles. The same concerns hold true when factoring ratings for existing buildings.
5. Automotive MPG ratings are not a single fixed number. Using one score to identify all of the potential energy use in a home is misleading. The way a home uses energy in the summer is vastly different than the winter; yet we are trying to use a single figure to reflect the entire energy consumption of the home.

Even the best energy use prediction models are only accurate within plus or minus 10 percent--representing a 20 percent variance. In reality the realization rates for most modeling software programs is closer to 30-40 percent. Do we really want to invest millions of dollars and countless man-hours to create a rating system that is only slightly more accurate than a flip of a coin? Regulating energy software in an attempt to improve accuracy will limit innovation and force contractors to use a specific tool with uncertain results, the exact opposite of what we are trying to achieve.



The entire HERSII process, and any proposed single rating system, needs to be evaluated based on evidence and market feedback. We cannot adopt a system that has no connection to empirical data as a means of improving accuracy. The HERSII process is complicated, expensive, and lacks the accuracy to produce meaningful ratings.

A much more effective approach would be to reduce regulation and support market driven solutions. We must move to a market that relies on actual performance, not complex regulatory structures translated into software and numerical scales. Fortunately, with the advent of smart meters and big data, we have the opportunity to move beyond regulatory proxies and instead harness private markets and sources of capital. We should embrace this change. It is time for California State policy to lead the nation towards a smarter, more efficient model that can deliver the deep energy efficiency we will require if we are going to meet our climate, energy, and economic goals.

### Proposal

Efficiency First believes that the regulation as written is not something that can be implemented without causing major disruption to the marketplace. While the original goals may have been noble, we have now proven that several critical assumptions were not correct.

Rather than attempting to comply with what is now clearly bad policy, the CEC should work with stakeholders and the legislature to fix this regulation, rather than attempting to comply with it.

As stated previously, we believe that a number of the proposals being put forward by the CEC in attempt to comply with the regulation, actually conflict with its clear intent. Efficiency First proposes that a fundamental rethinking is required. We recommend considering a much more flexible and less costly approach to achieving the State's goals.

A single rating system will not work, there is no one size fits all solution. We should accomplish our goals in new construction and existing buildings by finding solutions that work effectively for each sector. To that end we recommend that the CEC follow the consensus of new builders (if it is clear) and adopt a RESNET HERS rating for new buildings, which will align with the Energy Star Rating and the rest of the country.

The solution for existing buildings, rather than creating an extremely costly rating infrastructure, which will cost billions of dollars in consumer spending and state infrastructure, CA should start by requiring the disclosure of energy bills at time of sale.

There is a strong belief by many that energy bills, while not an asset score, are in fact a lot easier for homeowners to understand. Knowing that an average winter bill is \$234 is



actually more informative and relevant than a 123 on the HERS scale or a 7 on the Home Energy Score, even if the customer has to normalize in their head for occupancy, etc.

This approach would also be virtually free to implement (would not cost CA homeowner billions of dollars) and would not require the creation of a massive new state bureaucratic infrastructure.

An option could then be given at time of sale to both the buyer and seller to opt into an asset score if they choose.

The current regulation is very specific, and Efficiency First believes that it is clear that it cannot be implemented as written, and that current CEC proposals go far beyond the letter of the law.

We believe that based on the wealth of experience we have gained in the last decade, it is time to fundamentally revisit California's thinking on labeling, and to create a solution that balances the real value of labels with the costs associated.

Its time for a rational, data driven, rethinking of how we achieve the State's goals in a way that works for both homeowners and industry.

Sincerely,

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