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NZEO Comments - Whole-House Home Energy Rating and Labeling Pre-Rulemaking 23-HERS-02

The following are comments and recommendations by Net Zero Energy Operators for the whole-home energy ratings Whole-House Home Energy Rating and Labeling Pre-Rulemaking 23-HERS-02:

1) What home energy rating and labeling services and programs currently exist? DOE Home Energy Score has been developed in coordination with many industry experts and should be embraced as the standard for California <https://www.energy.gov/eere/buildings/articles/home-energy-score> . DOE Home Energy Score is an asset based assessment, rather than a performance based assessment. That said, either an energy model comparing to some established baseline year and/or energy benchmarking metric (EUI/ECI) should be used to establish the baseline score of a home “ for performance.

a. Which existing programs are the most developed or have completed the largest number of ratings? No comment.

b. Which existing programs successfully promote consumer awareness and education on the monetary and or environmental benefits of energy efficiency? BayREN successfully implemented DOE Home Energy Score program <https://www.bayren.org/home-learning-center/home-energy-score-hes>

c. Which existing programs promote energy-efficient construction practices?

d. Which existing programs increase compliance with building standards? HERS raters should be implementers of DOE Home Energy Score program “ with additions that meet the requirements of California Energy Code.

e. Which existing programs are recognized by appraising and lending communities and may result in higher real estate values? No comment.

2) What asset rating tools and software can be used to generate home energy ratings and labels?

a. What dwelling types can these tools assess “ single family, low-rise multifamily, high-rise multifamily, mixed-use buildings? DOE approved softwares and/or so-ftwares that leverage technologies / methodologies equivalent (i.e. EnergyPlus). Furthermore, tools that leverage measured performance through monthly utility bills should be leveraged to determine the impact of measures installed. The use of monthly utility bills allows for simplified and equitable access to measuring energy performance. Benchmarking tools, which compare buildings by age, occupancy, geographic region, and climate zone with information available through public databases should be considered (EIA.gov CBECS & RECS survey).

b. Are these tools capable of assessing performance, assets (independent of performance), or both? Aspects of both performance and assets should be utilized on the development of a whole home energy rating “ because assets provide the context for the energy performance of a home. They are interconnected and interdependent.

One without the other simply does not tell the whole story. A modeled approach utilizing an industry accepted methodology (e.g. EnergyPlus) for assessing new construction and existing construction homes for energy performance. In addition, a measured approach using monthly utility billing and home build characteristics can create effective comparisons among homes by comparing the Energy Use Intensity and Energy Cost Index amongst similar build homes. Similar build homes can be defined as homes that share the following features in common: build year, number of stories, HVAC type, square footage range, window type, thermostat type, insulation type, water heating type, etc.

c. What inputs are required to generate home energy ratings? Performance based inputs – energy consumption (gas [therms] and electric [kwh]), energy demand (kW), and lbs of CO₂e. Incorporating carbon emissions equivalent into the metric would measure the direct impacts towards the environment and support California’s mission to reduce GHGs.

d. What assumptions and/or boundaries are assumed by these tools? Site based measurements only. No source based measurements should be utilized in the whole home energy score rating.

e. What calculations or algorithms are used to generate the ratings? EUI and ECI based on monthly utility billing information. Benchmarking tools should be developed to properly develop these calculations. Models utilizing EnergyPlus shall be considered acceptable, based on their ability to model hourly (8760) data.

3) What are the most important elements to creating a successful home energy rating and labeling program? Creating a balance between as-built construction (asset) information and energy data evaluation (modeled and measured approaches). One cannot exist without the other. The DOE Home Energy Score is a good start for asset based evaluation. However, another approach needs to be added to supplement energy data evaluation (modeled and measured).

4) How specific and accurate do home energy ratings need to be? Measured approaches should use monthly utility billing data for ease of interpretation and calculation by HERS raters. Hourly data should be used by modeled approaches. The intent of a home energy rating is to allow for simple comparisons to be made between a relatively efficient and inefficient home. From this perspective, simple comparisons to measures of energy use intensity and energy cost index could be valuable.

5) What metrics/units are most important to include on home energy ratings (e.g. energy bill costs (\$), energy (kWh, Therm, BTU), energy use intensity (KBTU/ft²-year), greenhouse gas emissions (CO₂e)? I see energy use intensity and energy cost index as the core components of a home energy rating. Cumulative energy consumption values (kWh) or gas consumption (therms) cannot be compared alone due to variance in home size and build year. Homes must be compared on some relative measure. Therefore, home size (sqft), stories, and build years should be the relative measures used between homes. Should these units be normalized by floor area?

6) What are known or possible barriers to providing reasonable estimates of potential utility bill savings, and reliable recommendations on cost-effective measures to improve the energy efficiency of homes? Are there examples of existing programs that have overcome these barriers? Barriers exist when trying to access utility billing information,

but monthly billing statements provide the easiest opportunity for HERS raters, contractors, or homeowners to measure their energy use intensity and energy cost index. Most modeling softwares are complex and require training for users to accurately measure the energy performance of their home. However, software solutions may be developed that simplify the process allowing for that to minimize the barrier for creating cost-effective energy efficiency measures.

7) There are many different rating scale systems that could be used (e.g., 1 through 10, 1 through 100, grades A, B, C, etc.). Should a scaling system be considered? If so, what scale and labeling system should California's home energy rating and labeling services learn from and why? A scaling system can be used. Such a system should be created around comparable home construction for existing homes (home floor area, stories, build year).

8) How can California's home energy rating and labeling services rate both newly constructed dwellings as well as additions and alterations to existing dwellings on the same rating scale? New construction ratings should use asset based and modeled based approaches to developing home energy ratings. Existing homes should use asset based methods and measured based methods for developing home energy ratings. Modeled approaches may be considered for existing homes, given certain site-based evaluations are made to capture as-built features.

9) How can the CEC encourage adoption and use of a voluntary home energy rating and labeling services? For existing homes, the CEC should consider home energy ratings being conducted by HERS raters "qualified to rate homes. In addition, whole home energy ratings should be required for the use of the IRA HOMES and HEEHRA rebate to provide quality assurance to the outcomes of the home energy project. Braiding this whole home energy rating with the IRA HOMES and HEEHRA rebate will provide long standing value to homeowners "which are able to translate the value of these home energy improvement projects to future tenants through a whole-home rating. Furthermore, attaching this rating to the IRA HOMES rebate and HEEHRA will accelerate the adoption of the whole home energy rebate.

10) How can the CEC ensure the benefits of home energy rating and labeling services are equitably distributed to California's low-income and disadvantaged communities? No comment.

11) Should California's home energy rating and labeling services provide a process for accepting other third-party rating systems to be recognized by the CEC? How could this be technically achieved considering programmatic differences? No comment.

12) What role(s) should field professionals or assessors have to support California's home energy rating and labeling services? Whole-home energy assessments should rely on the existing network of HERS raters to conduct field surveys of home assets. However, energy data (modeled or measured) should be capable of being evaluated remotely. Those remotely certifying shall hold credentials demonstrating their ability to proficiently review energy data (HERS, CEA, CEM, etc.)

a. Is there a need to certify these individuals or entities? If so, what knowledge and skills do these professionals need to possess? No comment.

b. Who should certify these individuals and entities? Should these individuals and entities be regulated? No comment.

c. How can the CEC ensure there is an adequate and well-qualified workforce to

provide statewide coverage of home energy rating and labeling services? No comment.

13) What level of quality assurance is warranted for voluntary home energy rating and labeling services in California? No comment.

14) What is an acceptable cost for completing home energy rating and labeling services in California? In-field assessments should be no less than \$500 dollars. Remote assessments should be no less than \$250 dollars. These both should be supported by the IRA HOMES and/or HEEHRA rebates.

15) What other valuable information should be included as part of California's home energy rating and labeling services? No comment.

16) What organizations or stakeholder groups should be made aware and invited to participate in the home energy rating and labeling proceeding? No comment.