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Mr. Bill Pennington
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

I was in attendance at the HERS Phase II Workshop at the CEC on August 14, 2008. On behalf of The Heschong Mahone Group, I support and commend the efforts AEC and the CEC in development of the HERS Phase II regulations. I believe the proposed tool to be a well planned and logical approach for improving energy efficiency in existing homes. HMG hopes the HERS rating protocols and software that result from Phase II legislation will be useful in the implementation of utility incentive programs for both new and existing multifamily buildings. Consequently, I have some comments and suggestions in several areas.

A. The Rating Scale

I am in agreement that a zero on the rating scale should represent a zero net energy home. However, I suggest the scale used be the actual energy use in the building, as simulated by the rating software, in kBtu/sqft. This scale is stationary, so would not be influenced by updates to the California energy code updates. Consistency over time is essential in keeping home owners informed about how their home compares to others at any given point in time. The energy use scale is also recognized by consumers, as it is similar to the scale used in Energy Star refrigerators. If necessary, reference points to current new construction energy standards could be shown on the scale to give perspective to the home owner. For that matter, there are a number of possible reference points on the scale that could be plotted to give the home owner some perspective and guide him/her towards setting appropriate energy efficiency goals.

B. Printed Certificates and Graphics

I suggest the rating certificate and scale, as well at the audit certificate, be colored in a way that they are legible when printed or faxed in black and white.

C. Terminology

I recommend using the term "Whole-Home Energy Rating", rather than "Whole-House Home Energy Rating". Using both "house" and "home" is redundant. The term "house" is also suggestive of single family application only.

D. Multifamily Buildings

I am concerned that multifamily buildings have not been properly addressed in the development of the proposed rating tool and HERS procedures. I understand the desire to keep protocols simple and consistent across dwelling types, however, I also recognize the importance of laying out specific protocols for multifamily dwelling units, apart from single

family homes. There are a number of issues in multifamily projects that require attention if the HERS Phase II regulations are to work efficiently and benefit all parties.

Until 2005, there were several loopholes in the California Energy Code for multifamily homes. For example, central hot water systems and small proportions of west-facing glazing of multifamily homes were compared to individual water heating systems and large amounts of glazing, typically found in single family homes. Multifamily developers were getting credit for characteristics that were standard in multifamily building. For this reason, there is perhaps more opportunity for improvement in newer multifamily homes than in newer single family homes. It is incredibly important not to overlook multifamily buildings as we move forward in developing codes and legislation for residential buildings.

The largest barrier with energy efficiency upgrades in multifamily housing is that of the split incentive. In rental units, the common problem is that owner pays for energy efficiency upgrades, while the tenant reaps the benefits of lowered utility bills. Therefore what is cost effective to the owner of an owner-occupied dwelling unit is not necessarily cost effective to the owner of a rental home, whether single or multi-family. Furthermore, though the tenant may have 12 months of utility bills for the dwelling unit, the building owner, will in most cases not have access to those bills for utility bill analysis. In order to determine what is cost effective in multifamily housing, there needs to be a software input for which utility bills the owner pays.

In condos, the split incentive issue is with central water heating systems. Often the HOA is responsible for gas and water bills associated with central hot water systems. These systems are considered common property and cannot be upgraded by an individual owner, so should not be considered cost-effective upgrade options. If the energy upgrades recommended to building owners are not realistic and cost effective, it is highly unlikely that the owners will take any action to improve efficiency in their buildings.

Additionally, there needs to be specification on modeling protocols for multifamily buildings. Does each multifamily building get modeled as a whole, or by dwelling unit? If modeled by dwelling unit, how should central hot water heating by modeled? If exterior lighting on single family homes is analyzed, should lighting in hallways and other common spaces also be analyzed in multifamily ratings? Should this be dependent on who pays the utility bills?

HERS Phase II needs to address multifamily building explicitly if we are to catalyze improvements to this significant portion of existing buildings. I have only grazed the surface on the issues associated with energy efficiency in multifamily buildings. We need specific protocols for this building type that will result in recommendations that are truly cost effective for rental owners and condominium owners. If multifamily buildings are analyzed in the same manor as single family buildings, it is unrealistic to expect to increase efficiency in multifamily buildings, as the analysis and recommendations are not useful to the building owner. HERS raters must be trained to understand multifamily building types, limitations, and opportunities.

Thank you for your time and consideration. I anticipate the enormous impact this tool will have on meeting our statewide energy goals.

Sincerely,

Elizabeth McCollum

Associate Implementation Project Manager

Heschong Mahone Group, Inc.

8/25/2008

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PROFESSIONAL QUALIFICATIONS

HERS Rater (Home Energy Efficiency Rating System), CHEERS www.cheers.org
- Existing Home Rater, 2001, 2008
- HERS Rater, 2001, 2005
  - Core, Shell, HVAC, PV
- Title 24 Analysis, 2004

GreenPoint Rater (Build It Green) www.builditgreen.org
- New Construction Rater, 2006
- Existing Home Rater, 2008

CEPE (Certified Residential Energy Plans Examiner), 2008 www.cabec.org
General Contractors License, CA #656183, 1992
California Building Performance Contractors Association (CBPCA), 2003 www.cbpca.org
Energy Star Partner (EPA), 2002 www.energystar.gov
EPA Refrigerant Certification 2001
ICBO Certified Building Inspector, 1990 (not current)

Comments on "California Home Energy Rating System Program Docket Number 08-HERS-1"

I have been a CHEERS HERS Rater for Energy Code Verifications and an Existing Home Rater since 2001. I have used 3 different software tools in that time. CHEERS RateTool 2.1, 4.2, and TREAT. Until recently I have never had anyone ask me for a "Rating". What everyone wants in an "Audit" and to get recommendations one ways to improve their home.

The problem with "Ratings" always has, and will continue to be the difference between predicted use and reality. Some of these differences are due to occupant behavior, but not exclusively. The fact that we limit the energy uses within a home that is "Rated" compared to everything that is reflected on the utility bill is another. Even if we compare space heating,

cooling and water heating, which we can relatively accurately determine there are large discrepancies.

Why is their so much difference between predicted results and reality? Because there are far too many "assumptions" that have to be made about how the building, the equipment and the occupants behavior. We have not in the past done the hard work to narrow the gap.

Does this mean that "Ratings" have no value? No! They are the only way you can compare the potential energy use of one home to another. Various programs do, and will use such "Ratings", such as EEM's, Energy Star, etc.

Of course the only fair comparison would be 2 houses side by side, of the same size and configuration, in the same climate, but with different features. Because the predicted use and the reference house change as you change any of the input variables. We should be comparing the predicted use of house compared to the predicted use of other houses, and not to a "similar" reference home.

The proposed Regulations are a major step in the right direction on addressing our existing housing stock. Currently we have no standards or regulations address this critical piece of meeting or State's AB32 goals, the 2009-2020 Strategic Energy Efficiency Plan, Green Building, and other goals.

In 2001 not long after I started doing "Ratings" I gave up on the RateTool's. I was not happy with the poor results, and the software was no flexible enough to handle additions. Another problem with doing just "Ratings" is what the market is willing to pay. They are use to getting contractors that give "free" estimates. Of course the contractors can only provide the customer with the solution that they sell, whether or not it will address their concerns. Wild savings claims are often made, especially by window contractors. Customers are increasingly recognizing that they need to have someone come and look at everything and give recommendations that will address their concerns, their just not use to paying for it yet. And then there is the poor quality of work performed by the majority of the market. There was talk of linking "Raters" up with contractors in the RCP (Residential Contractor Program) shortly before the program ended. Linking "Ratings" to getting the work done, and properly, to quality installation standards, is critical. It is a lot of work for a "Rater" to develop contractors themselves.

I quit doing "Ratings" and would give people recommendations, and offer my services as a properly trained contractor to do the installations. In 2002 I was very hopeful when I learned of the CBPCA (California Building Performance Contractors Association). At the time I was working on an M&V project for HVAC change outs that utilities had giving large rebates on. Leaky ducts, low airflow, improper AC charge, etc. What a waste of money, throwing good money at bad work. While the RCP program may not have been perfect, the contractors had to go through minimal training, agree to adhere to minimum industry standards, and there was

verification of work performed. It seemed that the CBPCA had software and was going to address many of the issues with existing homes. In May 2003 I went through the 6 day class. Unfortunately we did not receive training on the TREAT software, and were required to buy and use it for the program. I spent a lot of time trying to use it, and effectively. It had the capability to do a HERS Rating, and use utility bills and weather data to "tune" the predicted model to the actual use. To make a long story short, it worked, but was difficult to use. I am including a report I wrote later in the year after I taught the software at the next training.

While I struggled with TREAT I developed a spreadsheet that allowed me to do some of the same things. I had to use externally produced load calculations, but everything else was internal. I was able to get the same results as TREAT, but easier. I was never able to more fully develop my spreadsheet due to various reasons. By early 2004 I had decided that any tool would have to be able to do California Energy Code compliance, HERS Rating, and a bill based audit, as well as Tax Credits, and National Energy Code compliance. This would reduce reduntcy of data entry and increase flexibility, now if we could just design HVAC systems without having to recreate the same data that would be great. Of course what we need is different software that can communicate between each other without have to duplicate effort. With 2ea T24 Energy Code compliance software programs on the market, I decided it would not make sense to create a 3rd because is a limited nitch market. Not having the time, the money, energy, or skill to develop the idea I went nowhere with it. I finally bought Micropas to do calculations, and would compare existing homes to current code. It's not that hard to bring them up to current code.

SOFTWARE

Making the software have to be "certified" as T24 energy code software "first" is an excellent move.

Making software part of the approval of the HERS Provider cause several problems. It creates duplication of effort and cost to develop. CHEERS, Build It Green, and CalCerts are all working with EnergyPro to develop "Rating" tools. CBPCA has not committed yet to what platform it might work off. Then we have EnergyCheckUp, although they currently have software, they will have to develop T24 compliance software, and become a "provider", or possibly team up with someone else. All will have to do the same things, but will be slightly different, and may even end up producing different results (will get to test this soon since CHEERS and Build It Green software are both released). Build It Green is going to have to become a "provider" or team up with one since they will be providing a HERS Index. Since different programs may only work with one "Provider" we Raters are forced to belong to multiple organizations, go through redundant training, pay redundant fees.

T24 Energy Code software is not required to be part of the "provider" approval. There are 2ea software programs for low rise compliance, and unfortunately only 1ea for non residential. Both programs can export data to be use by the CHEERS and CalCerts Registries (as far as I know CBPCA does not have this capacity, since they focus on the change out and retrofit market). The market has limited choice, I chose Micropas, but recently have had to

purchase EnergyPro to do non residential, and CHEERS and Build It Green existing home programs.

The approval of software should be separated from the approval of the "Provider". Let the software developers compete to produce tools. Let the Raters choose which software tool they want to work with, and what "Provider" they want to work under. And let the EE Programs work with all "Raters", "Providers", and software.

We already have too many "Providers" and too many programs and they do not always work together. They do not all have the same requirements. This makes our jobs as Raters more difficult and more expensive. Then throw in local jurisdictions with differing requirements, and it is a big mess. Part of the 2009-2020 Strategic Energy Efficiency Plan is to address this, and the proposed regulations will make this harder.

SOFTWARE APPROVAL

"The software approval procedure is one of self - testing and self - certification by the HERS provider."

Well, now I understand why the 2ea current software programs give different results, and there is variability even within EnergyPro. Both T24 Energy Code compliance software programs allow you to do things you are not supposed too. Micropas allows you to alter the Appendix IV assembly inputs, because you have to manually enter them. You can also model things at less than the Mandatory Requirements when running a file as a "new construction". Otherwise Micropas is very stable and reliable in its calculations. EnergyPro also allows you to model things at less than the Mandatory Requirements when running a file as a "new construction". I am also told you can manipulate the Appendix IV assemblies, but don't know how to yet. EnergyPro sometimes gives you different answers when you have not made any changes to the inputs. EnergyPro also allows you to model HRV's in the low rise residential module even though it is not an allowable credit under 2005 (because it does the non residential also).

Since all the "Rating" software has to be built on top of T24 Energy Code compliance software, it will share all the limitations and problems of that software.

The Energy Commission needs to exercise greater control over the software to ensure accurate and consistent results. You need to control the calculations and let the different software developers create different interfaces so they will all produce exactly the same results!

HERS CERTIFICATE & REPORTS

2.1.1 The Rating Scale

The Rating Scale should go from 0 to what the actual Index number is (0-225 for example). If the home Index is less than 0 it should go from 100 to 0 and then to the actual Index number (100-0-(-10) for example). An image of a house with the Index

should be used for the house, and an image of the sun should be used with the Index for the house with the renewable energy.

2.1.3 Energy Impact

I have long thought on of the problems with the T24 Energy Code is displaying the energy budgets in source energy and now TDV. These numbers are abstract to people, including building professionals. Displaying the predicted energy use in site energy and costs especially will have a much greater impact on people and decision making. Solar Hot Water has not been directly address in how it's contribution is to be displayed. One of the problems with PV systems is in the net metering. People only see what their net use is (actually they only see the net cost, especially with TOU rates) and loose track and confuse what they consume verses what they produce. And with solar hot water you usually don't have any idea, and it varies so much by time of year and water use.

The CO2 estimate should be base on the average for the utility where the house is since it varies so much throughout the state. The predicted or actual energy use should be displayed without any renewable energy systems (PV, solar hot water, or other). The predicted energy production of the renewable energy system should include PV, solar hot water, and any other systems.

2.1.4 Site Information

The number of stories should be added. The type of structure should be added (new, existing, existing + alterations, existing + addition). The orientation of the "front" of the building should be added. The conditioned floor area of the existing, and additions should be included.

2.1.5 Energy Efficiency Features

The report needs to have enough detail that a contractor can bid off of it. Showing the efficiency of the equipment alone is very misleading. I have seen 90%+ furnaces that with duct leakage and heat loss were delivering less than 50% net efficiency. The distribution losses have to be included in the efficiency reporting. The summery report should only include the net and average efficiencies of the components, and a more detailed description of the home would include a summery of the individual components that make up the whole system.

The area of each component should be included. The R-values, U-values, SHGC, etc. should be the average of all the different components. The equipment efficiencies should include the distribution losses to reflect the real "net" efficiency. A more detailed summery should also be part of the report showing a larger level of detail.

2.2 2.3 Recommended Improvements

When producing a custom recommendation report it may be confusing to give the customer both the standard and custom recommendations.

When using the custom approach only the recommended measures should be shown, or any remaining "cost effective" measures should be shown last as other measures that should be considered.

2.3 2.4 Energy Consumption Analysis Report

Educating the customers about utility rate structures is a great idea, because most don't understand them. Will most consumers understand the graphs with simulated, normalized and actual consumption comparisons? It's an apple to oranges comparison anyway, since the actual consumption will include everything, and the simulated results exclude a variety of potentially significant energy uses. Normalizing bills also may not be understandable to customers since weather can vary significantly year to year. It may be better to only show what the bills would have been (or were) for the past year, based on the actual weather data, and actual utility rates (since gas prices fluctuate monthly).

Simplify the graphs to make them more understandable and meaningful to customers. Use and costs should be broken down by all major end uses.

2.4 2.5 Data Input Summary

A slightly less level of detail than every input might be clearer and more understandable to the customer. I often model every section of walls, floors, or roofs separately even when they are the same construction and orientation. Orientation might not be understood by many if not referred to a front, left, back, right, or perhaps north, south, east west. Although we have to clearly define what the "front" is. R-values not U-values should be shown for floor wall and ceiling assemblies. U-values & SHGC for windows, AFUE, EF, etc. where it the common term. It will create confusion if R-4 cavity insulation is shown for Un insulated floor, wall and ceiling assemblies, R-0 for cavity insulation should be displayed.

Only the total for one construction assembly for each orientation and of the same type should be shown. Un insulated floor, wall and ceiling assemblies should display R-0 for cavity insulation.

2.5 2.6 Post-Retrofit Utility Bill Analysis (Optional)

This is an extremely important step that is under recognized. Doing so will help us "tune" the prediction models and assumptions. Although the bills include everything and the simulation doesn't.

3. The California HERS Index

I am concerned that by creating our own Index we are again not consistent with the rest of the country and may loose out in various programs that will be based on an Index. Since the goal is "zero energy" (actually net zero TDV, and not for all uses) there is no need to adjust the Index as the codes are strengthened, there reference point will just get closer to 0. The scale

could be in kWh or Btu's (site energy) instead of numbers, and would represent true "net zero energy". No human inhabited structure will ever likely by "zero energy".

The Index should be (or also be) calculated based on national standards.

4. Modeling Procedures and Assumptions for the Rated Home and Reference Home

The problem with our current method of code compliance is the reference home. Essentially every home has it own energy code. The reference home is base partly on the modeled home, so as it changes the reference can change. So unless 2 homes are the same, in the same climate zone, they can't really be compared side by side. This is another apple to oranges comparison. The European Passive House approach is a single energy budget per sq ft, regardless of size or climate. This approach probably penalizes smaller houses, and because it has no restriction on size does not limit the ability of people to build monster houses they don't need and that waste tons of energy. Some system that combines a single energy budget per sq ft, but with tiers for house size, probably with a decreasing budget would probably be a better approach. If you can afford to build a bigger house you can afford to build a more efficient house (although maybe slightly smaller) Whether or not to adjust for climate zones is another issue.

We need to consider changing the basis of how we compare a house to code.

4.3 Utility Rates Model

Using tiered pricing is very critical. TREAT only did average prices, as did my original spreadsheets. A little over a year ago I created some spreadsheets to do tiers, break down utility bills into tiers and price periods properly, etc. but it is a very difficult job. Most utility bills don't go from the 1st of the month to the last day of the month. Most bill dis aggregation programs I have seen just assume the bill was for a giving month. This is not a very good method, and the proper adjustments should be made. It would be nice if we had access to a greater level of detail on the energy use, and time of use. Currently EnergyPro only gives you a monthly view. Micropas can give greater detail currently. We should be able to see the predicted output for PV and Solar Hot Water, as well as the uses for all end uses. This should be viewable by year, month, week, day, hour, off peak, part peak, peak, etc. The output should be viewable as site, source and TDV energy. Currently EnergyPro only handles 3 tiers, so this needs to be upgraded.

Allow the Rater to have access to a greater level of detailed output. Properly handle actual utility bills to reflect the proper baselines, and costs.

4.5.1 Refrigerator/Freezer

EnergyPro currently only lets you input up to 3000 kWh/year for refrigerators. Data on existing refrigerators and freezers is hard to find. Home Energy has a large on-line database. I have long wanted to try to consolidate data, especially on older model equipment into a single source so it is easier to identify equipment and find the data.

We need to develop comprehensive databases of equipment efficiency ratings.

4.5.2 Dishwasher

I would not know how to find the EF for a dishwasher, unless it was a very recent and energy star model. I run my dishwasher once a day, 1219 sq ft, 3 bedroom, single occupancy single family home (I have 2 refrigerators too).

4.5.6 Miscellaneous Electricity

This is a large category, especially for some houses, and a growing one. I have seen houses with a TV in every room. The proliferation of electronics, cordless devices, etc, and often left on when not in use. This is a very hard end use to quantify in larger energy consuming homes with lots of uncertainty. This is grossly underestimated in such homes, and over estimated in low energy using homes.

4.6 Lighting

Lighting is another wildcard in large energy using homes. With tons of recessed light, exterior lights, landscaping lights, etc. It is very hard to end use to quantify in larger energy consuming homes with lots of uncertainty. This is grossly underestimated in such homes, and over estimated in low energy using homes.

4.8 U-Factors for Un insulated Construction Assemblies

I am not convinced that this correction is the whole answer between predicted and actual results for heating and cooling. By making the corrections to R-4 walls and ceilings and R-10 crawlspace assemblies, we are greatly reduction the "cost effectiveness" of upgrading the insulation, which may run counter to what needs to be done.

We need to do a lot more work to understand and correct the differences between predicted and actual use.

4.9 Infiltration

I have never calculated or though in terms of SLA. Recently I calculated it on a house and it was 10.25 SLA, I suspect that older houses are far leakier than the 4.9 SLA default. Although adjusting it only makes the gap between predicted and actual results wider. I prefer using the CFM leakage rate per sq ft of building enclosure area, it is easier to calculate and more directly comparable between buildings.

ASTM E 779-03, Standard Test Method for Determining Air Leakage Rate by Fan Pressurization. E779-03 is a multipoint pressurization and depressurization test, yet we reference it and are taught and told we only have to do a single point pressurization test. ASTM E1827-07 covers that, why are we not referencing it? I don't like either and am working on some simpler and reliable testing methods that should give accurate and reliable results.

4.11 Ancillary Energy Uses

We have to think outside of the building on this issue, because the customer gets a bill for everything. It is not enough to build an efficient house and then fill the yard with pools and spas, ponds and landscaping lighting, barbeques with refrigerators, etc. People are often shocked after they add such things, they never give the energy use and cost any consideration. These uses are not insignificant, and ignoring them undermines all our other efforts.

We need to think outside of the building box and include all energy uses on the property.

4.12 On-Site Photovoltaic (PV) Production

We need to include domestic solar hot water, solar pool and spa heating into the calculations too.

5.1 Inverse Modeling3

While I am not familiar with the inverse modeling procedures I have been doing bill dis agrations for 7 years. You can learn a lot about a building in 15 to 30 minuets by doing so. You get fairly accurate understanding data on the heating, cooling and water heating uses usually. This lets you know there relative importance in the total picture. I have seen houses that HVAC was a small part of their problems (pool, spa, lighting, refrigeration, etc. being larger problems). I have also found potential gas leakage, because the large use was far out of what we might expect. I am not total convinced we do not need to do it compared to weather data, nor that normalizing the data is worth it. Do we have access to enough weather data? With TREAT we only had access to 6 city in all of California. TREAT did not do dis agragation very well with the results changing every time you changed the model to try to adjust to the actual bills.

The inverse modeling should not have any direct connection to the simulation model.

5.3 Post-Retrofit Evaluation

This is a very important feature that along with comparing actual bills to predicted results up front will help us fine tune or modeling and saving prediction capabilities. We were supposed to be doing this with the CBPCA 5+years ago, yet I have seen no data on any actual results.

5.4 Energy Bill Estimates

As long as we handle tiers correctly we should be ok. The only thing that I am not sure of is how do we handle the different end uses, baseline verses seasonal (heating & cooling) so everything is valued as you would be billed for it in reality.

6.1 The Standard and Custom Approaches

In past versions of CHEERS RateTool and the current one there has been a standard and custom approach. The standard approach has some limitations because it is a global change to all assemblies to bring it up to a standard that may not be achievable in all locations. The custom approach has to be able to make upgrade recommendations assembly by assembly to reflect

what's actually achievable. In the current version since it is built on EnergyPro I am not sure how this is going to be able to be done, since you model an existing house as "existing & addition/alteration". If there have been any upgrades above the code for when a house was built you use up the 2 places you input. So unless there is a 3rd place to input "recommended" upgrades, assembly by assembly, I don't see how it will be done. I may be missing something (not enough training on the software yet). What I have been doing for 3-1/2 + years is create one file for the existing condition, and than modify it (create a 2nd file) with the recommended upgrades.

6.2 Cost-Effectiveness Method

"Cost Effective" is often an excuses to not do the right thing. People do not do a cost effective calculation on most things, even when it might save money in the long run. People will spend a lot more money for something than they have too for a variety of other reasons. My dad, a mechanical engineer at LBL argued against insulting the walls in the houses I grew up in. When I was 26 I convinced him to let me insulate the walls in the house they have owned since before I was born. Just think how much more "cost effective" it would have been had it been done 10, 15, 20, 25, years before. I installed a PV system on the house in 2006 that was not cost effective base on their level of energy use (so go figure). I am concerned about the method of determining cost effectiveness. The things that are most cost effective (cost the least to install, compared to energy saved) at any tier price, are given priority at the top tier rate. As we work our way down, and in price tiers, we reduce the cost effectiveness. So when we get to the more expensive things to install we are valued at a lower price tier, reducing the cost effectiveness even more. This is not how we get billed, the baseline uses make up the lower tiers, and the seasonal uses peak up into higher tiers. We get billed differently than how we are determining cost effectiveness. We need to evaluate cost effectiveness of every measure as if it was the only change we are going to make (this is one way I have been doing it). Or we need to rank uses by baseline verses seasonal use so the cost effectiveness is valued the same way it would be billed. I have done this yet, but I think I know how to do it. When I have compared the individual method verses a package of measures you get a large difference. The CBPCA had a bill dis agragation spreadsheet that you had to guess at what the interaction would be.

We need to calculate the cost effectiveness of measures as they would actually be billed to get beyond the simple measure that everyone hasn't even done yet.

6.4 Energy Rates

"Most residential utility rates are tiered; that is, the price per unit of consumption increases as consumption increases. For this reason, it is important to include all energy uses in the analysis, even though recommendations may not be generated for them, especially big energy users such as pools and spas."

If all energy uses are important we need to incorporate them into the model

6.5.2 Modeling Assumptions That May Be Modified

With the Custom Approach

If this is anything like my experience using TREAT 5 years ago it will not be done by the majority of Raters. When we have actual billing data and use the inverse modeling or other bill dis agragation method we know how much energy is use for heating, cooling and maybe water heating. Chasing you tail like a dog to try to guess what variable to change and how much, recalculating, and going back again and again is a loosing proposition. There is a very simple method that will produce the same results with a lot less effort. I developed it, and proved it almost 5 years ago.

We need to be able to tune the model to the actual utility bills simply quickly and easily.

6.6 Determining Measures and Costs for Measures that Affect the California HERS Index

One difficulty with the whole cost effectiveness issue is the cost of upgrades. If we give people costs that do not reflect what they will reasonably pay then they may be upset. Typically the costs used are too low, higher more accurate costs reduce the cost effectiveness.

6.8 Energy Bill History

It might be useful to compare peoples actual bills to bills for there area. This is especially true if someone is a high user, but should not be done for a low user. We need to have more accurate data for local areas, broken down by house type, size, age, etc. The 2004 RASS (Residential Saturation Survey) has a wealth of information, but is not detailed enough.

7. Data Collection Procedures

As a Rater I have seen how buildings get modeled by various professionals including CEPE's. I see missing assemblies, often calculate different areas, see efficiency values that are higher than modeled, I rarely see shading modeled and missed opportunities for credits reflecting what is being done, especially when a HERS Rater is already on the job. Without testing we are guessing at duct and air leakage, and AC EER's. It's not uncommon to be told to go to the nearest foot and round every dimension and calculation up. Orientation to the closest +/- 45 degrees is too large a band. There is no clear and constant practice in the industry to model buildings accurately. I have also tried to tell professionals that they can model something in a certain way only to be told you can't, when it is clearly in the code you can do so. Garbage in garbage out. We do not really know how much better or worse a building is compared to code when it is not modeled accurately. The utilities loose opportunities to take credit for more savings. Of course all of the calculations are theoretical and so are the savings, since the discrepancy between predicted and actual is wide. The regulations make a big step in this direction, but will require the entire energy modeling industry to be retrained to make sure it's done correctly.

We need to model buildings consistently and accurately for maximum benefit.

8.1 Specialized Rater Certifications

It's very important that the roles of the various "trades" under the proposed regulation be clear, and that the customer can understand them. Currently HERS Raters for new construction and change outs have several layers of certifications, core, HVAC, shell, pv, tax credits, non-residential, etc. Does the average customer understand what the Rater is certified to inspect? Currently there are "Raters" who are not certified, or not in California performing Verifications. With the new proposed regulations we are adding 4 new regulated "trades" performing "audits" or "ratings". Will the customer understand who can do what? Probably not.

The terminology is cumbersome and needs to be cleaned up. What we currently call a HERS Rater is being called a "California Field Verification and Diagnostic Testing Rater". The don't and can't actually perform a "Rating" under the regulations. All they currently and will be able to do is perform Verifications for to the Title 24 energy code standards. The CF-1R's call it out as "HERS Verification required". While it will take time to shift the use of terminology, it would be worth it in the long run because it better clarifies and defines what they can do.

They should be called "California Energy Code Verifier" (CEC Verifiers) or maybe "C-HERS Verifier" (less desirable).

The "California Whole House Home Energy Rater" is actually someone who will be able to do "Ratings", using House and Home is redundant. Is a "Rater" also by default a "Verifier" that seems to be the case but should be made clear?

They should be called "California HERS Rater" or "C-HERS Rater".

Can "California Home Energy Analyst" do a "Rating" on a new home without direct supervision of a "C-HERS Rater"?, There seems to be some conflicting language about this, existing homes no, but on new construction it appears they can. The CABEC CEPE seems to have been left out of the picture, even though for the NSHP they are the only one's that can do the CF-1R's. Do they qualify as "Analysts" or will they have to get yet another "certification" from yet another "Provider"? And pay yet another "training" fee, and pass yet another "test"? Does CABEC have to become a "Provider"? Many of us "Raters" are also CEPE's.

They should be called "California Energy Code Analysts" (CEC Analysts) or "C-HERS Analyst" (less desirable).

The "California Home Energy Inspector" can only do a restricted amount of data collection under the direct supervision of a "Rater". The relationship between the various "trades" needs to be better defined". The "Analyst" and "Inspector" can only work under direct supervision of a "C-HERS Rater". If they are an employee it's clear, but what if they are a subcontractor? Or what if they work and are paid independently? Are 3rd Party contracts allowed? What kind of direct supervision does the "C-HERS Rater have to provide? Are we mini "Providers", do we want the responsibility or the liability? And "Raters" and "Providers" are separated by the conflict of interest rules anyway.

Rating verses Audit

Calling a "Rater" an "Auditor" also is confusing. This distinction should be dropped. What we are calling an "Audit" is really a "Rating" since it is theoretical minus the HERS Index, and not based on actual use.

8.3 Special Requirements for Building Performance Contractors

For a "Rater" who can't or does not want to provide installation services it is important that they have qualified professionals they can recommend to people. Building Performance Contractors are an important part of linking the recommendations to getting the work done. Building Performance Contracting is really more of a General Contractor trade. They may do some or all of the work themselves or hire specialty subcontractors. We also need a large base of qualified specialty trade contractors to refer work to.

Allowing Building Performance Contractors to perform HERS Ratings on their own projects undermines the conflict of interest rules that have been in place since 1999 with the adoption of the HERS Phase 1 Regulations. As one myself, I also know others that feel the same way.

The BPC is not exempt from independent 3rd party Verification under the proposed Regulations when required by the energy code. The 2008 sampling rules will increase the number of independent 3rd party Verification the BPC will need. These requirements will be expanded in the future to meet the state's goals; the BPC will increasingly need to have independent 3rd party Verification, such as making all HVAC measures mandatory in all climate zones.

Several proposals to address this while eliminating the possibility fro conflict of interest have been proposed at the May 2nd and August 14th workshops. Robert Scott, CHEERS Executive Director proposed the use of 3rd Party contracts, which are allowable in the 2005 Energy Code. I have in written comments and as well as at both workshops suggested using independent 3rd party Raters to do the Audits & Ratings and to sample 1 of 7 of each of the BPC's have installed measures. Have also suggested that the BPC be subordinate to the independent 3rd party Rater as the "Analysts" and "Inspectors" are in the proposed Regulations. Other possible solutions include requiring the BPC to be in a VSP (Verified Service Provider Program) and 1 of 7 installed measures sampled by an independent 3rd party Rater. The Rater should be independent of the VSP program. Since the only BPC association is also a HERS Provider with a VSP, the Rater would not be independent of the BPC, the BPC association, or the VSP. Another possibility is allow them to provide a "HERS Index" at the end of the job, but still be under the direction of a "Rater".

The Building Performance contractor is prohibited from doing a "Rating" unless they do "substantial" energy upgrades, what is "substantial".

What is stopping a Building Performance Contractor who is also certified as a "Rater" with another provider (as I am) from doing a 'Rating" and then later doing the improvement work at a later date?

The Building Performance Contractor should not be called a "Rater", and should not be allowed to do a "Rating" unless under the direct supervision of a "Rater".

"The Building Performance Contractor" must have training and certification by the Building Performance Institute or other organization approved by the Energy Commission, in the health, comfort, and safety aspects of the operation of homes". There are so few Building Contractors currently and most do not seem to have the background and depth of understanding. Often they don't understand basic concepts. There is a lot to know and skills to be a Building Performance Contractor. What certification is required? How many people in the company have to be certified? This is totally unclear and needs clarification. BPI certification may be a barrier to expanding the contractor base. It also has standards that are not the same as we use in California. Some of the required testing is more detailed than needed on most jobs. I am not really sure I want to be fully certified yet. There are already too many competing, duplicating, conflicting certifications, programs, requirements that I have to deal with. I have taken and passed 4 written tests, and have to admit some were the hardest I have had to take so far.

BPI certification should not be required at this stage of the evolution of Building Performance Contracting in California.

8.3.3 Field Verification and Diagnostic Testing of Improvements

Finally as Building Performance Contractors we will be required to install and test and verify our installed measures to a high, defined standard. This has been missing all along. The 6 or 9 day training does not fully cover all these, and will require additional training, including the full "Rater/Verifier" training.

8.3.6 Provider Quality Assurance

5% may be more provider QA than needed if we have an independent "Rater" directly supervise the Building Performance Contractor.

APPENDIX B Standard Recommendations

Having what recommendations have to be included is a good thing.