

ENERGY STAR v3.1 Comments

This is a compilation of all comments received by EPA during the Draft Version 3.1 ENERGY STAR Certified Homes comment period ending December 20, 2013.

The following comments have been compiled verbatim from the ENERGY STAR Certified Homes Proposed Guidelines Comment Forms submitted by respondents. The Environmental Protection Agency is not responsible for any typographical errors or omissions.

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ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Organization Name: Alan Agle LLC

Respondent Last Name: Agle

Respondent First Name: Alan

Comments:

I would support your rolling out v3.1 as a single standard nationwide. I feel it would be consuming to have multiple implementations. I live in Utah, and I deplore this state's backward attitude towards construction improvement. I see no reason why you shouldn't help to effect change here by maintaining at ENERGY STAR at national levels, consistent with other states. Since Utah has both very hot and very cold zones, fully robust standards for ENERGY STAR certification are warranted.

I'd like to see you give a credit for small homes, as does LEED in its size adjustment. It is so difficult to get low ACH numbers on a small building, that a point or two credit for the compact size, meaning truly less energy per occupant, would be fair and appropriate. I agree with the USGBC on this.

Last comment, more a query: how far along is the v4 team? One of the confusions a year ago was v2.5, and the extension of that. Decimal versions have sort of a bad feeling to them. Unless you really need to roll out an interim standard, it probably would be preferable for partners and for the marketplace to face only full version releases, every three years. An uneasy partner and client sense of a "moving target" of standards will work against adoption rates and certification promotion. As a strong advocate of green certifications (LEED AP, NAHB Verifier) I get a lot of contractor "blow back" about changing standards. V3 was particularly tough for my HVAC subs. I'm glad it was and is, but I fear additional resistance from a decimal update following fairly quickly on v3 going hard itself. For subs, a three-building-season upgrade time frame is probably about right, emotionally.



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Organization Name: The BER

Respondent Last Name: McTaggart

Respondent First Name: Chris

Comments:

None of the links work on the website for the documents.

Also, you all should be aware that MA has NOT yet implemented the 2012 IECC. It will not go into full effect as the statewide code until July 1, 2014.

Therefore, you should delay the implementation of v3.1 for MA until after the state officially begins enforcing 2012 IECC, or one year after this date, as you've stated will be the case for the rest of the country.



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Organization Name: Energy Diagnostics Inc.

Respondent Last Name: Brown

Respondent First Name: Matthew

Comments:

Energy Diagnostics Inc. has reviewed the criteria for the proposed changes to Energy Star Version 3.1 and would like to offer the following comments/guidance to the process moving forward.

Findings:

- Energy Star Version 3.1 not taking the individual state amendments to the 2012 IECC into account will make the program quite stringent for many builders "i.e. Illinois amended the 2012 IECC to 5ACH at 50pa and the u-value table" While DOE may state it is equivalent to the 2012 IECC I can say first hand the 2ACH at 50pa Difference has a profound impact on the construction practices and means and methods used. In fact if you take all the Illinois amendments into consideration you end up with a home 6% less efficient than the 2012 IECC. Version 3.1 meeting a 15% more efficient home than the 2012 IECC would mean a 21% hike in efficiency for most of the Energy Star builders in Illinois. The cost of meeting these requirements would be detrimental to builders with an average price tag of \$4,582.69 in upgrades to attain only \$140.00 in yearly savings would take 32.73 years to pay back (see attachment).
- Builders in this market will likely have a difficult time making an investment of this magnitude for such little savings, it can be a difficult sell. The market has moved these builders up in efficiency very quickly the last few years and they already have a difficult time getting homes to appraise with the energy upgrades made and adding significant cost with little overall savings potential will be difficult in the current market.

Proposition:

- We understand that Energy star is intended to be an above codes program, but with so many ways to currently comply with the codes that can be difficult. Utilizing and basing the percent above code must be based on the states actual code because the US Department of Energy's analysis doesn't reflect the actual level of energy efficiency relative to code. Future codes will allow for the HERS Index to be utilized for compliance.
- Energy Diagnostics Inc. would recommend and support utilizing the states current code level and setting the bar at 10% above including equipment and advances technologies. This would ensure all program goals are met. It would deliver a home that is above the minimum code but also sets an attainable and cost effective goal. We feel this would be a good compromise for meeting everyone's expectations as many builders are struggling with cost not only of the energy code but also base building code requirements in a relatively tight market.
- Energy Diagnostics Inc. supports all efforts and goals for efficiency but also incorporates a cost effective strategy for builders and developers to comply. In looking at all conditions of Version 3.1 it could create a hard sell for us and potentially reduce market share due to its stringency with little reputable pay back. It is imperative that all these scenarios be considered as you develop the guidelines further and distinguish how you will roll the new guidelines out. We encourage you to keep those out selling the program in mind as you develop these changes and contact us with questions and concerns as they arise.



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Energy Star 3.1 Cost Sheet (3400sq ft)				
<u>Item</u>	<u>Change</u>	<u>Sq Ft/Area</u>	<u>Cost each</u>	<u>Total</u>
Ceiling Insulation	R-45 to R-49	1441 sqft	\$0.15	\$216.15
Window U-value	.34 to .28 U	377 sqft	\$1.10	\$414.70
Exterior wall insulation + Foam Board	R-19 + 1.3 to R-21+5	2272 sqft	\$1.37	\$3,112.64
Extension Jambs for R-5 Insulation	Add Extension Jambs	13 each	\$40.00	\$520.00
Foam Rim and Band to achieve 3 ACH	R-19 FG to R-22 Foam	152 sqft	\$2.10	\$319.20
			Total Cost	\$4,582.69
			Energy Savings	Per year \$140.00
				Simple Payback 32.73 years

* Prices taken from 4th quarter builder price index chicago land and 6 county surrounding area. Published 11/2013



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Energy Cost and Features

Property
NEW HOMEOWNER
3.1 TEST HOME
IL, IL 60664

Weather: Chicago, IL
3.1 SPECIFICATIONS
VERSION 3.1 SPECIFICATIONS.big

Organization
ENERGY DIAGNOSTICS
800-390-8091
JERRY THATCHER

Builder
D.R. HORTON

HERS
Projected Rating
02/03/12
Rater ID: 1800052



Annual Energy Costs (\$/yr)	3.1 TEST HOME	3.1 SPECIFICATIONS	Savings	%Saved
Heating	838	711	127	15.1%
Cooling	128	137	-9	-7.4%
Water Heating	287	290	-3	-1.2%
Lights & Appliances	825	799	26	3.2%
Photovoltaics	-0	-0		
Service Charges	275	275		
Total	2352	2212	140	6.0%
Average Monthly(\$/Month)	196	184	12	6.0%

Energy Features

Ceiling w/Attic	R-45 ATTIC* U=0.022	R-49 ATTIC* U=0.020
Sealed Attic	None	
Vaulted Ceiling	None	
Above Grade Wall	R-19 + 1.3-BOARD* U=0.056	R-21 R-5* U=0.043
Foundation Walls (Cond)	R-11 WALL* R=11.0	R-19 WALL* R=19.0
Foundation Walls (Uncond)	None	
Doors	STD STEEL INSUL DOOR* U=0.147	STD STEEL INSUL DOOR**** U=0.147
Windows	CAMBRIDGE* U=0.330	.28 .30* U=0.280
Frame Floors	R-35 BLOWN* U=0.029	R-35 BLOWN**** U=0.029
Slab Floors	Uninsulated U=0.663	
Infiltration	Htg: 3.00 Clg: 3.00 ACH50	
Infiltration Measure	Blower door test	
Mechanical Ventilation	Air Cyclor: 80 cfm, 5.4 watts.	
Interior Mass	None	
Mechanical Equipment 1	Heating: Fuel-fired air distribution, 125.0 kBtuh, 92.1 AFUE.	Heating: Fuel-fired air distribution, 80.0 kBtuh, 95.0 AFUE.
Mechanical Equipment 2	Cooling: Air conditioner, 36.0 kBtuh, 13.0 SEER.	Cooling: Air conditioner, 36.0 kBtuh, 13.0 SEER.
Mechanical Equipment 3	Water Heating: Conventional, Gas, 0.63 EF.	Water Heating: Conventional, Gas, 0.63 EF.
Programmable Thermostat	Heat=Yes; Cool=Yes	
Ducts	Uninsulated Conditioned space	
Duct Leakage to Outside	25.00 CFM @ 25 Pascals	

Note: Where feature level varies in home, the dominate value is shown. Only changed features are shown for second building.

REM/Rate - Residential Energy Analysis and Rating Software v14.3
This information does not constitute any warranty of energy cost or savings.
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ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Energy Cost and Features

Property
NEW HOMEOWNER
3.1 TEST HOME
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Organization
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JERRY THATCHER

HERS
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Rater ID:1800052



Weather:Chicago, IL
3.1 SPECIFICATIONS
VERSION 3.1 SPECIFICATIONS.blg

Builder
D.R. HORTON

Energy Features

Total Duct Leakage	25.00 CFM @ 25 Pascals	
Lights/Appliances	Defaults	
Active Solar	None	
Photovoltaics	0.00	

Note: Where feature level varies in home, the dominate value is shown. Only changed features are shown for second building.



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Organization Name: Energy Home Basics

Respondent Last Name: Glanville

Respondent First Name: Bruce

Comments:

I have been a HERS Rater in Tennessee since 2007. While I think V3.0 was needed to complete the Whole House concept I think we are going past market acceptance for this product. Many builders were lost in transition from 2 to 3 and I am certain we will lose more as we push into the realm of diminishing returns. Please do not become a bureaucracy that struggles for relevance as code overtakes you.



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Organization Name: Energy Inspectors

Respondent Last Name: McGhie

Respondent First Name:

Comments:

As an ENERGY STAR Partner, we understand the Environmental Protection Agency's (EPA) position for increasing the energy efficiency of the ENERGY STAR for Homes program to address a more stringent 2012 IECC code.

However, we believe that there is a great potential to create more harm than benefit with this change. It is our position that the EPA should wait and utilize the IECC 2015 code as the baseline for their next change to the ENERGY STAR program. Listed below are the main reasons we believe this will be a more successful and beneficial approach to all stakeholders:

1. The ENERGY STAR program should be consistent across the entire nation, providing a simple, clear way of conveying the energy efficiency of a building, as well as its quality. The current proposal for ENERGY STAR 3.1 further clouds the picture of what an ENERGY STAR home means in the market, which will lead to a dilution of its value.
2. The IECC code has begun to taper the percentage of improvement in the overall energy usage of the building from code cycle to code cycle. The 2006, 2009, and 2012 code cycles required an approximate 15% improvement, whereas the 2015 code is 5% over the 2012 code. The rationale for this tapering is that the amount of "cost-effective" solutions for adding to the energy efficiency of the home is dwindling, and as such, there is a need to slow down the improvements, allowing technologies to catch up with the energy code. The EPA ENERGY STAR program is directly impacted by the cost effectiveness of the program and if the program appears to be reaching too far too fast, builders will move to alternative programs.
3. While 2013 has provided greater financial stability to the new home industry, we are recovering from historic lows and homebuilders are still very concerned about the stability of the market. Presenting another uncertainty through the addition of ENERGY STAR 3.1 may be more than most builders are willing to absorb at this time, resulting in a migration away from the program that would not occur if rolled out in slightly more stable economic times.

Energy Inspectors' recommendation is to forego implementation of Version 3.1, with respect to the 2012 IECC adoption, and focus on the 2015 IECC for the next version of ENERGY STAR.

We look forward to further discussion to help continue the success of the ENERGY STAR for Homes program. Energy Inspectors will continue to support the program and remain a valuable partner/resource to the ENERGY STAR team



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Organization Name: EnergyLogic

Respondent Last Name: Schwarz

Respondent First Name: Robby

Comments:

1. House tightness limits moving to 3 ACH 50. In those areas where we are on the 2012 it has been very difficult attached housing, any housing that shares a fire adiabatic wall, to meet 3ACH. There is a huge disconnect between the energy code and the fire code and these units are very difficult to get tight.

2. I spoke briefly with Dean, asking about states that do not adopt a state wide code. Colorado is a home rule state so each jurisdiction adopts the code and currently jurisdictions are all over the board in terms of the code they have adopted. If ES moved to version 3.1 this could lead to much confusion. Dean indicated that version 3.1 would only apply to states that had a state wide code. I can't see that this would last forever and at some point Colorado would have to move to version 3.1. I would suggest that a phase in period be considered and would hope that we got plenty of warning before such a move happened.

3. It seems like the performance path will become less flexible as the reference home ramps up. I do not know of one builder that is using the prescriptive path so how will these changes really affect the ability to work with builders on the most cost effective way to meet the intent of the program.

4. As we know, Energy Star v3 was released at the worst time during the down turn. Participation was, and has been, affected by our the current economic times. I worry that making these changes will potentially push builders out of the program and or make it difficult to bring new builder into it. I know that V3.1 will only go into effect in states that are already on the 2012 so this might not be as great a concern as I think. However, it also seems very difficult to have a national program that is not unified.



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Organization Name: Energy Services Group

Respondent Last Name: Marston

Respondent First Name: Thomas

Comments:

If 3.1 meets all 2012 code requirements when will EPA validate that an Energy Star home exceeds the code, eliminating the need to report both answers.

Code officials are not aware that Energy Star matches code in all aspects and exceeds code in a number of requirements. Can you declare that Energy Star 3.1 will surpass the requirements of the 2012 IECC. If you cannot provide this statement, can you state how 2012 IECC exceeds version 3.1.

Making a definitive statement may allow code officials to accept version 3.1 as an alternative path through IECC as allowed in 2012 IECC, see R102.1.1 Above Code Programs. This may lessen the burden for Energy Star builders who currently must prove that they are "Code Compliant" while also having to satisfy the requirements of Energy Star and undergo the scrutiny of the highly trained HERS Rater.

In Maryland, specifically, we find that homes tested for "code only" compliance routinely lack many of the requirements of 2012 IECC and Energy Star Home requirements. These missing details degrade the homes' energy performance and create potential indoor air quality issues.

Your guidance in this matter could allow Energy Star in Maryland to push beyond the 55% market share.



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Organization Name: En-Tech Associates, Inc.

Respondent Last Name: Vitale

Respondent First Name: Tom

Comments:

Comments on the webinar for 3.1 Requirements:

- Keep 2009 IECC as the national baseline
- Make any EPA Special Requirements by Climate Zone County Wide
- Performance Path Based 100% on Index Score / MPG / Kwh per SF / Btu per Square Foot / Peak Load / Whatever Method of Unit Measurement to Identify High – Medium – Low Performance
 - Example; basic colonial home with fully conditioned basement 1000 square feet per floor, 3000 square feet x 4 cfm duct leakage = 120 limit, the actual duct leakage = 240 so plug 240 in to the software and score the home on performance score or continue to seal the duct system to improve the score. The prerequisite to this is all ducts are in conditioned spaces, hard piped supply and return with visual documentation that ducts are well sealed.
- Have RESNET include the various mandatory codes associated with 2009, 2010, 2012 or 2015 IECC Codes, depending on state or locality as minimum R or U values but don't pass or fail a project that meets or exceeds target MPG.

This methodology I am suggesting will simplify the design process and advance performance over prescriptive, reduce rater and builder costs, increase the number of EPA projects while helping advance basic code issues throughout the country.



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Organization Name: Green Dream Group LLC

Respondent Last Name: Lunsford

Respondent First Name: Corbett

Comments:

If you make ENERGY STAR mean different things in different states, you are essentially killing the program. In IL, which has adopted the 2012 IECC, there's already hardly any ESTAR happening – this more stringent requirement will make even the minimal participation go away. If you want your program to live, you have to ignore the 2012 IECC, for the love of God.



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Organization Name: Home Energy Insight, LLC

Respondent Last Name: Kildea

Respondent First Name: Bob

Comments:

I've been asked by the local Habitat for Humanity if they can earn Energy Version 3.1 even if Michigan isn't using IECC 2012?



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Organization Name: LiveGreen

Respondent Last Name: Crawford

Respondent First Name: Morgan

Comments:

This program is way too cumbersome and time consuming. Fresh air should not be a component of Energy Star. Energy Star needs to be focused on efficiency and not air quality or water use. Those are great add on certifications, but have no place in energy star. Energy star homes are no longer efficient homes! Energy Star production homes are less efficient than code minimum non-Energy Star homes. We're finding that many Energy star homes fail HERO rebate because of the Fresh Air requirement and so it's costing builders \$1750-\$4000 in lost rebates if they do Energy Star! The checklists need to be combined into one checklist that the rater can complete solely.



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Organization Name: Northwest ENERGYSTAR Homes (NEEA)

Respondent Last Name: Wildenhaus

Respondent First Name: Dan

Comments:

- HVAC Checklists – allow for and encourage the adoption of checklist requirements that are appropriate to regional climates and equipment types, particularly with regard to heat pumps and air conditioning. In the mild, dry summers in most of the NW, enforcing mandatory sizing limits on heat pumps has a negative effect on savings in properly commissioned heat pump homes. Since our summers are mild and dry, oversizing and commissioning requirements for central AC systems are largely not applicable, nor do they encourage efficiency of equipment or program implementation and QA
- Load calcs – The current requirement to complete a room by room load calculation is a smart requirement to uphold. However, this requirement creates difficulties with actual implementation and review of the work. Software and methodology that are widely used among the HVAC trade on a national scale is hostile to review and poor at catching “fudge” factors that contractors routinely build into their load calculations. Research by IBACOS has demonstrated that including even a few of these fudge factors can have a compounding effect of overstating the home’s loads by far more than the sizing limitations set forth in the checklists to limit impacts of oversizing equipment. The Northwest ENERGY STAR Homes program suggests the creation of recommended or required data points within the software files, reports upon QA, or the use of a more transparent software and reporting method such as SpecPro.
- Room by room airflow measurement or “test and balance” – The measurement of room by room airflows is a good exercise for helping to ensure comfort within each zone of the home. While this may have some impact on how the occupants interact with the systems of the home, thereby affecting efficiency, methods for measuring these airflows are not very accurate and the equipment is expensive. The Northwest ENERGY STAR Homes program feels that this requirement should be structured to allow for deviation in a portion of the rooms of the home. Additionally, providing additional flow to some locations and limiting flows to others (half bathrooms and laundry rooms) should be allowable, based on the contractor’s experience of which spaces within the home generate the most comfort concerns.
- Checklists (all) – Allow for alternate equivalent methods of meeting the intent of the checklists (subject to provider approval) where methods used demonstrably meet or exceed the intent of the checklist requirements. Insurance requirements, development participation agreement, and codes may all provide satisfactory oversight in meeting checklist intent.
- Decrease checklists from four to two, pre and post drywall, with several columns for Raters, Builders and Contractors to sign off on is a more reasonable flow and may be less intimidating for Raters and Builders to take on. This also aligns more closely with regional and national green building programs, whose requirement for ENERGYSTAR Homes at a designated level are one of the stronger motivators for builders in urban and suburban areas.
- Consider altering the importance of Quality Assurance/Quality Control over Rater checklists. Builders that participate in construction quality programs should be able to submit them to the program. With Provider approval, these should be able to trump some or all of the checklists being completed by Raters.
- Multifamily – Define low-rise multifamily buildings separately within the specification or provide multifamily-specific guidance for checklist items and verification requirements. Multifamily building stock can be



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

defined in a number of ways. Where townhomes and row houses are very similar in performance to detached single family residences, stacked or clustered multifamily units perform much differently. Prescriptive requirements for these unit types should be adjusted as these unit types require a different prioritization of measures. Additionally, stacked and clustered multifamily units may fall under commercial code and should use a separate reference design spec for comparison under the performance path.

- Energy savings calculations vs measured data – Efforts have been made to calculate the cost and savings associated with this ENERGY STAR specification. These calculations include assumptions that are unfounded with regard to how homes actually get built. The first and most fundamental is that the calculations assume a zero fail rate for all rated features of the home. The model home used for these calculations is also based on a single type of home, which may or may not be present in many markets throughout each climate zone. Additionally, the application of the two adjustment factors applied to the model, as referenced below, provide additional assumptions which derate the baseline home and inflate the savings of the home built to the specification. Without field evidence to substantiate these claims, these adjustment factors only serve to undermine the actual savings associated with this specification. An added 5% savings associated with verifying insulation to RESNET “Grade I” standards is dubious at best. The Northwest ENERGY STAR Homes program strongly encourages the EPA to provide some means of evaluating which measures have savings associated with them, through real billing analysis, and also a quantification or estimate of which rated features have highest fail rates, both upon verification and QA.

A 2007 study by Ecotope found that the base assumption of R 21 Grade 3 walls had a useful U-value of .060. An actual study of code homes (entirely batt insulation) found an actual U-value of .057. This improved U-value is incongruous with homes achieving a 5% savings with a subjective Grade 1 insulation package. From Ecotope's study:

“Next, two factors were applied to account for ENERGY STAR program requirements not fully credited in the RESNET standards and which help ensure that the thermal enclosure system and HVAC system in certified homes perform as designed. Because these requirements are not required by the 2012 IECC, the factors were applied to the baseline homes, thereby increasing their consumption. The first factor reflects increased convective losses because the baseline homes are not required to achieve Grade I insulation installation nor, in Climate Zones 4 through 8, alignment of the wall insulation with the interior air barrier. This was estimated to increase heating and cooling consumption in the baseline homes by 5%.

The second factor reflects less efficient operation of the air conditioner and heat pump because the baseline homes are not required to be commissioned, per the HVAC System QI Contractor Checklist. This is estimated to increase the heating consumption for homes with electric heat pumps and the cooling consumption for homes with air conditioners or heat pumps by 6.9%.”

- Low load homes and the question of resilience – The level of shell efficiency required by the 2012 IECC approaches a tier of home which presents unique challenges with regard to systems, indoor air quality, and resilience of the home to handle the impacts of systems design, installation, and commissioning that is less than ideal. Moreover, the home that is created by meeting the requirements of this specification is just on the precipice of creating real challenges with regard to system sizing. The Northwest ENERGY STAR Homes team suggests more mindful requirements surrounding system sizing and type, the use of balanced and distributed ventilation, and guidance for homeowners on home and systems operation. Homeowner operation and maintenance manuals, including “how to” guides for systems and controls, is the logical next step for low load homes.



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

- **Tools for Raters:** The EPA program (in conjunction with DOE, CMHC and other parties) can benefit Raters by providing data around deferred maintenance costs, lower insurance and reduced callbacks. These items are often promoted, but with ever improving code, these items become an increasingly tempting call to builders than a claimed increased efficiency (i.e. reduced bills) that are not supported by regional evaluations. In the Northwest, our Regional Technical Forum has routinely required additional measures in order to claim 15% savings due to more realistic baselines and more accurate performance modeling of efficient case homes. Without regional data to back up the additional benefits, version 3.1 will be increasingly difficult to sell to builders.



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Organization Name: Residential Review Division Planning and Development Review, City of Austin

Respondent Last Name: Gleason

Respondent First Name: Michael

Comments:

I noticed some confusing verbiage on the program requirements. Are the homes to be duct tested at rough in now and will all E star 3.1 homes have to have 100% of the HVAC system in the building envelope? What will happen with the existing leakage to outside testing requirement? Is there no exemption from duct testing based on all mechanical systems located within the building envelope?



ENERGY STAR Certified Homes Proposed Guidelines Comment Form

Organization Name: Standard Pacific of Colorado, Inc.

Respondent Last Name: Dutch

Respondent First Name: John

Comments:

I guess I would need clarification on Performance vs. Prescriptive. Are the items listed on the Estimated Cost and Savings document (Exhibit 13, CZ5, Gas) items that will be required even if we choose the performance path? If so, I think some of your costs are a little skewed. For instance, changing from a B-vent water heater to a power/direct vent water heater is closer to \$450-\$500. CFL cost should be an average of A-Type and Reflector costs so you aren't assuming that a builder is only having to change bulbs in non-recessed fixtures. This would be closer to \$4. In the Thermal Enclosure section you state we have to change to R-49 attic insulation based on 2012 code and that isn't the case using performance path. If I have to change from R-38 to R-49 this will cost me between \$300-\$500 per house for insulation and that doesn't include having to raise my truss heels to get R38 over the top plates of the exterior walls. Changing from .32 U-value to .27 U-value is much more than \$374. Our average window pack (.31 U-value, low-e, argon filled) is roughly \$4000. The best case scenario to achieve .27 U-value is to change to 366 low-e, argon, triple glazed which would add 40-45% in cost. Worst case would be to change all windows to casements with 366 low-e, argon which would be about a 90% increase. Your decrease of \$798 to move all ductwork inside of the thermal envelope is also not correct. If we currently have some attic furnaces, and we do, to move those inside of the home would require a complete redesign of the upper level of the home which would incur design costs anywhere from \$90 per hour to \$160 per hour. It could also potentially affect bedroom/bath design which could negatively affect the saleability of a particular plan or increase the square footage of plan incurring incremental square foot cost increases at the base house level (increasing our base budgets). My next concern is Energy Star's requirement for the adoption of 2012 code. Colorado is a home rule state so we don't adopt code at the state level. It's adopted at the local level which means we could have only one jurisdiction out of five we are building in that has adopted 2012 code so, in turn, we would only have one project out of five changed to v 3.1. That would then put us in an undesirable situation of competing against ourselves with house costs. If we're building the same plan in multiple cities and we have to raise prices at one community but not the others we could end up with a non-performing community as people move to other cities where they can buy the same house for less money or not buy from Standard Pacific at all.