

## DOCKETED

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*Comment Received From: Steve Dubin, CSI, et al.*

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**Response/ Comments on 6/1/17 High Performance Wall presentation**

*Additional submitted attachment is included below.*



June 14, 2017

To: California Energy Commission - Docket No. 17-BSTD-01  
RE: Draft Proposals for High Energy Walls for 2019 Energy Code

Rmax Operating, LLC values the work of the California Energy Commission (CEC) and its efforts to reduce energy use in residential and commercial construction. We thank the CEC for including Rmax in discussions about current and future energy codes and appreciate all of the opportunities to participate in the various forums and meetings meant to discuss best practices for moving towards, and eventually meeting, net-zero energy efficiency goals.

Rmax fully supports the CEC's goals of achieving U factors of 0.043 and 0.051 in residential high performance walls in the 2019 Title 24 energy code. To this end, we are happy to continue working with CEC staff to develop solutions that help builders meet current 2016 (and proposed 2019) energy code standards. We are constantly striving to improve existing products and solutions, as well as creating and testing new products to help stakeholders achieve these goals in a cost-effective manner while ensuring that the energy efficiency of these products and solutions are being properly accounted for within CBECC software for integration into the proposed 2019 Energy Code.

With this being said, we would like to comment on the HPW presentation given at the stakeholders pre-rulemaking meeting at the CEC's offices on June 1<sup>st</sup>, 2017. The presentation, on slides 6 & 7 for "2019 Prescriptive Single Family/ Multifamily", proposed an option to meet the U factor of 0.043 by building a wall with 2x6 wood studs, R21 batt insulation and R7.5 continuous rigid insulation. The presenter made mention that the rigid insulation in the example was a 1.5" material which implies either an XPS item, or a graphite infused EPS item. We feel that, while this is one example of how to meet the proposed goals, the presentation neglects to offer a solution using 2x4 wood studs. This implies that the only way to meet the new code is to change design. A builder who is currently using 2x4 framing will see a significant increase in material and labor costs which may be unnecessary as the same U Value can be achieved while maintaining a 2x4 wall assembly utilizing an R15 batt insulation and polyiso as the continuous insulation. For instance, a builder can use 1.75" of rigid insulation on a 2X4 wall and achieve better than U 0.043 if polyiso is used. The R value of 1.75" polyiso is 11.4. In fact, a builder who utilizes exterior sheathing, and includes the additional assumed R Values of that material into their HPW model, might be able to use an even thinner polyiso to achieve the required U Factor. The chart below shows available thicknesses of polyiso on the left and the corresponding R Values on the right.



0.5	3.2
0.625	4.0
0.75	5.0
1.0	6.0
1.1	6.7
1.2	7.4
1.25	7.8
1.3	8.2
1.4	8.9
1.5	9.6
1.55	10.0
1.6	10.3
1.7	11.0
1.75	11.4
1.8	11.7
1.9	12.4
2.0	13.1
2.1	13.8
2.2	14.5
2.25	14.9
2.3	15.3
2.4	16.0
2.5	16.7
2.6	17.4
2.7	18.1
2.75	18.5
2.8	18.9
2.9	19.6
3.0	20.3
3.1	21.0
3.2	21.7
3.25	22.1
3.3	22.5
3.4	23.2
3.5	23.9
3.6	24.6
3.7	25.3
3.75	25.7
3.8	26.0
3.9	26.7
4.0	27.4
4.1	28.1
4.2	28.8
4.25	29.2
4.3	29.6
4.4	30.3
4.5	31.0

We would also like to make an observation regarding the pricing for various rigid insulation options shown on slide 10 of the presentation. During the Q&A session following the presentation, it was verified that the prices shown were listed as a square foot cost per thickness. As listed on that slide, those prices could lead to a misunderstanding of the thermal values associated with each type of material as it gives the perception of significant price fluctuations for the same amount of material, regardless of the materials thermal performance. Rmax believes it would be beneficial to show Title 24 stakeholders the price “per R Value”, rather than “per inch”, as the code calls for R Values and U Factors



of insulation products, regardless of their thickness. As noted in the chart above, polyiso is available in a variety of R values beyond what the presentation listed. While thickness of the material does have an effect on the ease or difficulty of installation methods, it does not have an effect on calculating U Factors for a wall assembly. Additionally, the prices listed show numerous options, but do not reflect product availability in the area, and more importantly, do not address pricing volatility of the materials listed. This important information could impact stakeholders significantly from region to region. Unfortunately, pricing fluctuations affect all materials over time, but specifically in this case, insulation of all types have seen significant rises in raw material cost and availability since January of this year and are continuing to rise in the coming months. Utilizing pricing gathered today to model potential prescriptively built walls for 2019 would be problematic.

We encourage all stakeholders to also do a dew point analysis when modeling their high performance walls to avoid potential moisture issues associated with thicker cavity insulation and thinner continuous insulation. The potential for condensation is greatly reduced with a higher ratio of continuous insulation versus cavity insulation which keeps the interior side of the sheathing warmer, helping reduce the potential of mold and spore growth.

Rmax would again like to thank the CEC for including us in these energy code conversations. We look forward to continuing to help find ways to conserve energy by working with all stakeholders to help meet the current standards, as well as provide solutions for the changes coming in 2019.

Energy conservation is very important, and Rmax supports the CEC's continuing efforts to reduce energy usage in California. Title 24 stakeholders are encouraged to reach out to Rmax representatives for further information if desired.

Respectfully,

Rmax Operating, LLC