

ENERGY MODELING OF THE 2015 UC DAVIS SOLAR DECATHALON HOUSE

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PURPOSE

Provide (1) a comprehensive energy analysis of materials, appliances, and climate conditions (2) a Trimble Sketchup model of the Aggie Sol home, later rendered in OpenStudio (3) an initial scope of energy usage in accordance to the US Department of Energy's Solar Decathlon competition rules and scoring guidelines.

ABSTRACT

Energy modeling is a useful tool for anticipating energy consumption and energy efficiency. For the Solar Decathlon competition, energy is one of the ten sections where the Aggie Sol home will either receive or lose points. Hence, our team was asked to generate a energy model, which would shed light on the home's inputs, outputs and requirements [in regards to energy use]. Namely, whether the home will produce enough solar energy to maintain zero-net energy status.

RESULTS

Our OpenStudio energy model will output the total energy consumption of the Aggie Sol home during the course of competition. With the information we acquired from research on appliance, material, and thermal loads, we were able to configure an initial model, which Engineering Lead, Payman Alemi, will further refine towards the end of June 2015. This final model will clarify whether the home will be using more or less than the US Department of Energy's measured consumption maximum of 175 kWh.

CONCLUSIONS

Today, energy use has become the leading metric in evaluating building performance. Hence, through the development of innovative high thermal mass adaptive building materials, not to mention new software design tools, architects and engineers are able to both manipulate energy use, as well as building design. After researching the Aggie Sol home's appliances and building materials, we were able to render a Sketchup model, later followed by an initial Openstudio model. Overall, the information we obtained will help the engineering team make informed decisions regarding building design [over the next few months of construction prior to the competition.

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