

Abstract

Since 2002, the U.S. Department of Energy has sponsored the Solar Decathlon competition in which collegiate teams design, build, and operate solar-powered houses that are intended to be cost-effective, energy-efficient, and attractive. The Solar Decathlon is intended to educate students and the public about the economic and environmental benefits of energy efficient, solar powered homes. Unfortunately, due to the scoring rubrics for the competition, the affordability aspect of the competition is often given only superficial consideration. In the 2013 the Norwich University $\Delta T90$ house officially won first place for the Affordability Contest of the 2013 Solar Decathlon, with an estimated cost of \$168,385 for a 988 square foot house (\$170 per square foot), while scoring 100% for the energy balance portion of the competition. The $\Delta T90$ house maximizes comfort, efficiency, and spaciousness through two bedrooms, an office space, and an open living space for lounging, cooking, and gathering—offering a model for affordable and sustainable living. This paper will present design and construction details of Norwich University $\Delta T90$ house which allowed it meet the project design objectives.