

GREEN TECH THE SERIES COLUMN FOR NOVEMBER 4, 2015

HEADLINE: 2015 SOLAR DECATHALON: ANOTHER TECHNOLOGY JUMP

As has been noted before in this column, since 2002, the US Department of Energy (USDE) has, on alternate years, held a competition for colleges and universities worldwide, to design and build a home that is totally self-contained with respect to energy use; essentially a net zero or zero energy home. Each individual entry must build a liveable, affordable, accessible, marketable family home.

Each year in the past, I have watched this competition with interest, marvelling at the innovation of the students and how, often with minimal hands on skills, (they bring in skilled trades where needed) design and assemble some of the most innovative homes I have ever seen. Teams from Canada have competed, most recently in 2013, when a cooperative effort from Algonquin College and Carleton University, in Ottawa, and Queens University, as well as a separate entry from the University of Calgary entered the competition.

The concept of this decathlon has grown, from its simple roots in Washington DC, to competitions around the world. Spain has hosted a European competition. In Columbia, South America, there will be one in December this year, which the USDE has signed an agreement to support. China, where there has been a competition in the past, is, once again, proposed for 2017. Another will be held in the Middle East in either 2018 or 2020, depending upon applications received.

The next one in the US is scheduled for 2017 and this time they are changing the format considerably. Up until now, teams had to fund their own projects; some government assistance in the US was available but it was not extensive. With rising costs, this has hampered growth and the USDE has recognized this. For 2017, they are offering substantial prize money. Each team will get a minimum of \$50,000 USD and the top team will receive \$300,000 USD, which would likely cover the cost of the home making this an exciting possibility for all the entrants. The venue was moved from Washington to California and the past two have been held there. This time, there is a competition for promoters to take over the operation and promotion of the actual decathlon and the 2017 location has not been set as yet.

This year nineteen teams applied and 14 made the cut to final assembly. As mentioned, this is not an exclusive US competition. In fact, four of the 14 entries were joint ventures from around the globe. West Virginia University partnered with University of Rome; University of Texas partnered with the Technical

University of Muenchen, in Germany and Western New England University joined with the University of Panama. There was also one three way partnership - University of Florida, Santa Fe College and the National University of Singapore.

These homes are amazing. They are judged in ten different aspects, ranging from the obvious, like design and energy balance, to areas such as market appeal, affordability and home life values. This year, the team from Stevens Institute of Technology, in New Jersey, their third time in the competition since 2011, took top honours. In fact the highest score ever. In their design, they incorporated structural assembly to withstand hurricane force winds. Their realization was that extremes in climate are becoming a factor in how we live today. Called the "Sure House," they took top honors in seven of the ten categories. The home is surrounded by bi-folding storm shutters, made of a composite foam core, and then wrapped in a fiberglass skin. Installed to shade the home, once inclement weather is threatening, they are activated to protect the home from storm damage. The actual home was assembled using fibre-composite materials that are used in the construction of fiberglass boats. This near seamless method was a major contributor in the efficiency of the heating and cooling in the home. They got top marks here. One interesting plus, they partnered with a local BMW dealer in Eatontown, New Jersey and the Sure House was able to provide enough power to a BMWi3 to run for nearly 150 KM without a recharge.

Every year, when I review this competition, one team has a design or assembly concept that sticks out and this year was no exception. The team from Clemson University broke with conventional methods. Teams usually build their entry at home, then break it down and ship it, in sections, for final assembly at the competition site. The Clemson Crew actually built two homes that were called "Indigo Pine." The preliminary home was built at Clemson and then it was built a second time from off the shelf plywood. It was assembled by hand using screws and stainless steel "zip ties"; not a single nail was used, a prefab design, so to speak. They described their entry as, "a market rate, flat packed house that could be ordered on-line, custom-cut and then constructed by a homeowner or builder within a few days." This team came in sixth and it was the most affordable of them all.

I have just scratched the surface here. The USDE web site is, by far, one of the most informative on the internet. The contacts at each school are available and keen to talk about their homes. It was a pleasure speaking with them and it is nice to see that they are willing to share details of the homes and the knowledge

behind the information. Go to www.solardecathlon.gov and prepare yourself for an interesting few hours.

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