

NREL HOSTS RACE TO ZERO-ENERGY HOMES

In efforts to promote energy efficient building practices, collegiate teams compete in the Challenge Home Student Design Competition

By David Glickson

National Renewable Energy Laboratory



Teams and judges participating in the Challenge Home Student Design Competition stand in front of the LEED Platinum CAFÉ at the National Renewable Energy Laboratory in Golden, Colorado. The event, which took place April 26 and 26, featured 28 collegiate teams presenting their cost-effective, zero energy ready home designs.

The campus of the Energy Department's National Renewable Energy Laboratory (NREL) sprang to life on a late April weekend as 28 teams of university students and building industry experts converged at the lab for the Challenge Home Student Design Competition.

During the inaugural competition, funded by the Energy Department's Building Technologies Office, teams of students presented their zero-energy-ready home design and construction plans to juries of national experts including the leading high-performance builders in the industry, building science professionals, and researchers.

"Buildings are critically important when it comes to reducing U.S. energy use, as they represent more than 70 percent of our electricity consumption and about 40 percent of our carbon emissions," said NREL Center Director for Buildings and Thermal Systems Chuck Kutscher. "How we build in the future will determine how successful we are at addressing climate change. NREL is very pleased to host and support this design competition because it is a way for students to learn the techniques and strategies that will be necessary to make sure that the buildings of the future get designed and built properly."

PREPARING THE SUSTAINABLE BUILDING LEADERS OF THE FUTURE

The Challenge Home Student Design Competition aims to inspire the next generation of architects, engineers, and construction managers to be able to design and construct zero-energy-ready homes that are affordable and market ready. Each team included students and their faculty advisors. Teams were encouraged to be multidisciplinary in makeup and to work as closely as possible with industry professionals to help inform their decision-making process.

On the Energy.gov blog, Chief Architect for the Building Technolo-

gies Office Sam Rashkin noted: “Each year, thousands of college and university students major in construction-related fields, including architecture, engineering, and construction management. These students enter into a competitive workforce that is increasingly demanding advanced knowledge and skills essential to delivering high-performance homes and buildings.

“The Challenge Home Student Design Competition will provide students with the skills and experience to start careers in clean energy and make them leaders in the movement to create truly sustainable homes.”

Student teams were asked to develop cost-effective designs that mainstream homebuilders can start using and homebuyers can start buying today.

“As an engineer in this field, I only wish that there had been a program like this available to me when I was a student,” said NREL Residential Buildings Research and Outreach

Coordinator Cheryn Metzger. “The team concept has them working on a project, with different disciplines collaborating just as they will in the real world, all while working closely

with experienced industry partners to help guide them through the process. The experience and knowledge gained by these students through their participation is priceless.”



The Montage Builders Northern Forest team (SUNY College of Environmental Science and Forestry, Syracuse University, and Onondaga Community College) presents its craftsman-style, sustainable design to a panel of judges during the Challenge Home Student Design Competition. The team won the grand award in the single family detached category.

Vanguard

/ˈvænˌɡɑːrd/

“A position at the forefront of new developments or ideas.”

The Flash Technology Vanguard™ lighting system for wind turbines has gone through rigorous testing protocols to ensure an industry leading design to withstand electrical surges.

Vanguard™ 370i for wind turbines:

- ✓ Surge tested in accordance to Lightning Protection Zone 0B described in IEC 61400-24 and IEC 62305-1
- ✓ Integrated, compact design for simple installation
- ✓ Patent-pending, photodiode ambient-light collector for most-accurate mode change
- ✓ Rugged GPS receiver for turbine applications
- ✓ Patent-pending, community-friendly optics
- ✓ Radar Interface Standard
- ✓ Night Vision Goggle compatible





Flash Technology

888.313.5274 flashtechnology.com





Montage Builders Northern Forest team's winning design in the single family detached category. [Courtesy of Montage Builders Northern Forest]



The Urban Harvest team from Ryerson University presents its design for an urban, high-performance townhome to judges during the Challenge Home Student Design Competition. The team won the grand award in the single family attached category.

AND THE WINNERS ARE...

The team design presentations were followed by intense deliberation by the jurors. The industry experts judging the competition then presented two Grand Awards to the best overall designs.

The first award was given to the Montage Builders Northern Forest team. Montage Builders was a collaborative effort of students from three Syracuse, New York, area schools: Onondaga Community College, SUNY College of Environmental Science, and Syracuse University.

The Montage team developed an adaptable and accessible craftsman-style single-family detached home that embodied responsible development. The team demonstrated leadership in the sustainable redevelopment of a community in Syracuse by presenting an affordable design based on the median family household income for the area.



The Urban Harvest team from Ryerson University presents its design for an urban, high-performance townhome to judges during the Challenge Home Student Design Competition. The team won the grand award in the single family attached category.

"We had an amazing experience participating in this competition," said team member Michelle Tinner, a graduate student in Sustainable Construction Management at SUNY College of Environmental Science. "It was a unique collaboration, building a team with diverse backgrounds from three different schools. But it was that diversity of experience and perspective that was the key to our success."

The Urban Harvest team from Ryerson University in Toronto, Ontario, was presented with the second Grand Award. The team developed a high-performance single-family attached townhome design that would fit well in any urban environment. The team addressed every aspect of the design requirements and integrated all systems artfully and effectively.

The Urban Harvest design was also recently selected to be a part of the Denver Super-Efficient Housing Challenge, and boasts a 90 percent reduction in annual energy consumption compared to an average Colorado residence. The design—along with homes by four other Challenge Home Student Design Competition teams—is slated to be

constructed at the Denver Sustainability Park in Denver's Curtis Park neighborhood in late 2014.

"The opportunity to do this design in a real-world environment, on a building that is likely to actually be built, was an invaluable experience for us," said team member Antonio Cunha, a graduate student in Ryerson's Department of Architectural Science. "In academia, most projects stay in the conceptual realm and never progress beyond a poster or a model. This process required us to apply what we have learned in the classroom with a much more realistic approach where we had to consider the same challenges and implications that we will use throughout our careers."

In addition to the two Grand Awards, the judges presented 12 subject area awards as well as technical awards recognizing teams for best design solution, best technical integration, best production home adaptation, and best presentation.

MORE THAN JUST A COMPETITION

A critical goal of the Challenge Home Student Design Competition is to facilitate the creation of a strong future workforce that can support the development of, and demand for,

zero-energy-ready homes. To that end, students were provided with an opportunity to hear from industry thought leaders who presented their visions for the future of sustainable

housing along with a series of technical presentations critical to advancing the students' knowledge of high-performance home design, engineering, and construction.

"This is the future of our industry," said Gene Myers, CEO of New Town Builders, a Denver-based builder of energy-efficient homes who served as a juror for the competition and also presented to the students. "It is important that we make this effort to develop a qualified workforce for the building industry. We need to nurture students who choose to engage in this topic, support the institutions that have made that possible, and encourage others to follow suit. A program such as this one is a great step in that direction."

The full attention and engaged participation of the students throughout the program indicated that their thirst for more knowledge continued even after having completed their designs and presentations.

"We may end up knowing more than our future employers do about green building design as a result of going through this process and the information we are receiving," said



The Urban Harvest team from Ryerson University presents its design for an urban, high-performance townhome to judges during the Challenge Home Student Design Competition. The team won the grand award in the single family attached category.

OILMISER™
Technology
by JLM Systems Limited

OILMISER™ Vapor Guard

- **No Moving Parts, No Maintenance, Works 24 / 7 / 365**
- **Keeps Lubricating Oil On the Inside, Not on the Outside**
- **Extends the Life and The Efficiency of Gearbox Air Breathers**
- **Cleaner Air means A Cleaner Workspace**

For more information visit our website www.oilmiser.com or telephone toll free: **1-888-RENU OIL (1-888-736-8645)**
E-mail: engineering@oilmiser.com

FOR THE WORKER WHO LIVES IN THEIR HARNESS
Peregrine Harness
with Adjustable/Detachable

800.633.3954
www.elkriver.com

Order Today!

Elk River, Inc.
Personal Fall Protection

Pull Down
Shoulder Adjusters Breathable Padding Lightweight Aluminum D-rings Removable Aluminum bar seat



Jake Kern from Illinois State University listens to a speaker during the Challenge Home Student Design Competition at National Renewable Energy Laboratory.



Members of the Opti-MN University of Minnesota team shake hands with the panel of judges during the Challenge Home Student Design Competition.

participant Martha Merzig, a graduate student in Integrated Design and Construction at Auburn University. “It’s an exciting thing to be equipped with that knowledge at such an early stage in our careers, and I have high hopes for what we are going to be able to do with it going forward into the future.”

A PERFECT SETTING

The student teams had the opportunity to present their concepts for zero-energy-ready homes inside the award-winning LEED Platinum and net-zero-energy Research Support Facility on NREL’s sustainable campus. And they were supported by

the world-class staff from NREL’s buildings research teams who have dedicated their careers to energy-efficient and zero-energy buildings. This synergy provided an ideal backdrop for the competition, one that provided inspiration and motivation to the students and staff alike.

“Our campus is a showcase for the right way to build buildings, and there’s no other place where we could have held this competition and have the students be as engaged as they have been here,” said Metzger. “They’ve gotten to see this type of design in action, and their interest is piqued even

further by that opportunity. They are truly excited to have the chance to be here.”

While developing and preparing their designs, the student teams regularly used research published by the laboratory as well as NREL-developed tools. This connection further demonstrated the synergistic relationship between the work of the students in this competition and the buildings research being done at NREL.

“We’ve got huge energy challenges in front of us, and it is a great opportunity to be able to engage directly with the next generation who will be tasked with helping us to innovate the future solutions to those challenges,” said NREL Senior Engineer for Residential Buildings Dane Christensen. “Hosting this event gave us the chance to show off the work that we are doing here, work that we are very proud of, and it also gave us an opportunity to hear from the students and see the very talented work that they are doing. It was very exciting to be able to witness their passion, dedication, and skill firsthand.” ↘

HEADLINES

Nordex targets further growth and improvement in earnings in 2014

On the basis of its audited consolidated financial statements, Nordex confirms the preliminary figures for 2013 which it had reported in February. Thus, consolidated sales rose by around 33 percent to EUR 1,429.3 million (previous year: EUR 1,075.3 million), with return on sales widening to 3.1 percent. Consolidated profit after interest and taxes amounted to EUR 10.3 million, compared with a loss of EUR 94.4 million in the previous year, which arose mainly as a result of exceptional expenses in connection with the strategic realignment of the Group.

The gross margin expanded from 21.4 percent to the planned level of 22.6 percent in 2013. This substantial improvement reflects operating measures such as cuts in