Touring the NIST Net-Zero Energy Residential Test Facility with USGBC Maryland

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The USGBC Maryland Chapter, under the leadership of Mary Pulcinella, Executive Director, and Nate Robb, Chair, Board of Directors, recently hosted a group of 25 green building enthusiasts for a tour of the Net-Zero Energy Residential Test Facility at the National Institute of Standards & Technology in Gaithersburg, Maryland. In January, the facility received the chapter's Wintergreen Award.

The LEED Platinum facility is a laboratory for the study of energy and water use, enclosed in the structure of a house. It was completed in 2012 with the intent to "enable the development and demonstration of measurement science needed to achieve net-zero energy residential homes." Lights, appliances and water-use fixtures are in place to mimic the energy and water use of two adults and two children. The team has taken great measures to ensure accurate testing results, including an absence of furniture for precise VOC measurements and a heater installed in the refrigerator to simulate the warmth generated by hot food cooling in a refrigerator.

Because the facility was constructed using federal government stimulus funds, all products had to be American-made, which presented numerous challenges, especially when it came to energy-efficient appliances. By the date the facility was completed, the manufacture of many of the more economically priced products that were planned to be installed in the facility had moved abroad; therefore, more costly choices were sometimes used. The heat exchanger, a product of Canada, is the single device that wasn't manufactured in the USA.

Although the team was unable to incorporate all of the energy-saving features that it had hoped to include, the airtightness of the house has been commended: The ratings for the walls are three times greater than the current code of R45, and the roof has rating of R72, which is two times greater than code. Visitors are often impressed by the thickness of the walls, the large windows with deep windowsills, and the efficiency of the building envelope.

As needed, products will be substituted with more suitable ones – already a heat pump compressor has been replaced because it wasn't rated properly for the low loads that it was experiencing. The architectural plans for the house are available on the website and will soon be joined by monthly operational data. This information will be especially compelling throughout the yearlong testing phase.

Participants found the tour by William Healy and interaction with engineers interesting and informative. Stay tuned to the NIST website for facility news and testing results.

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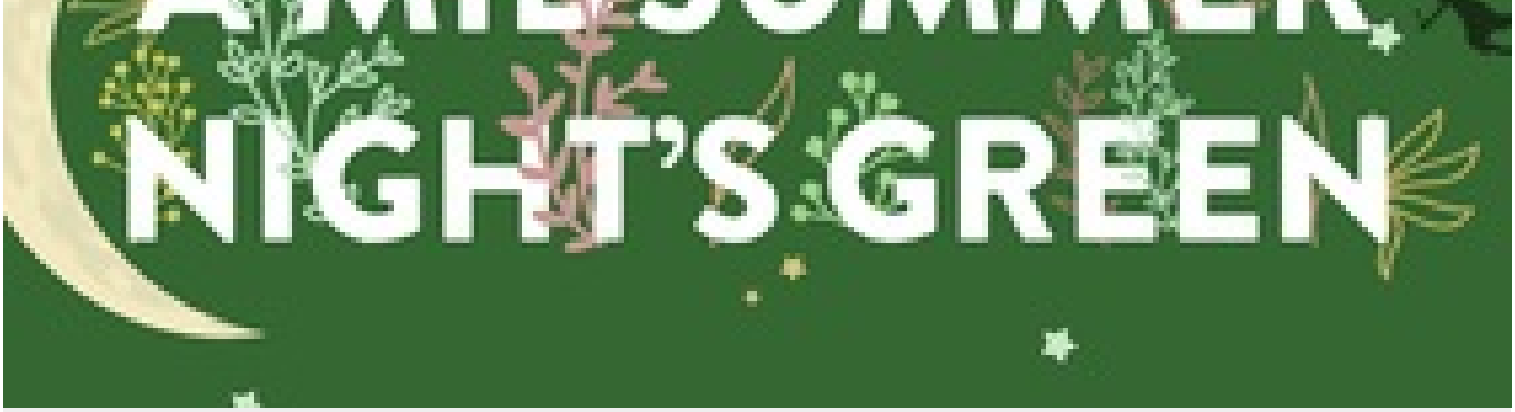

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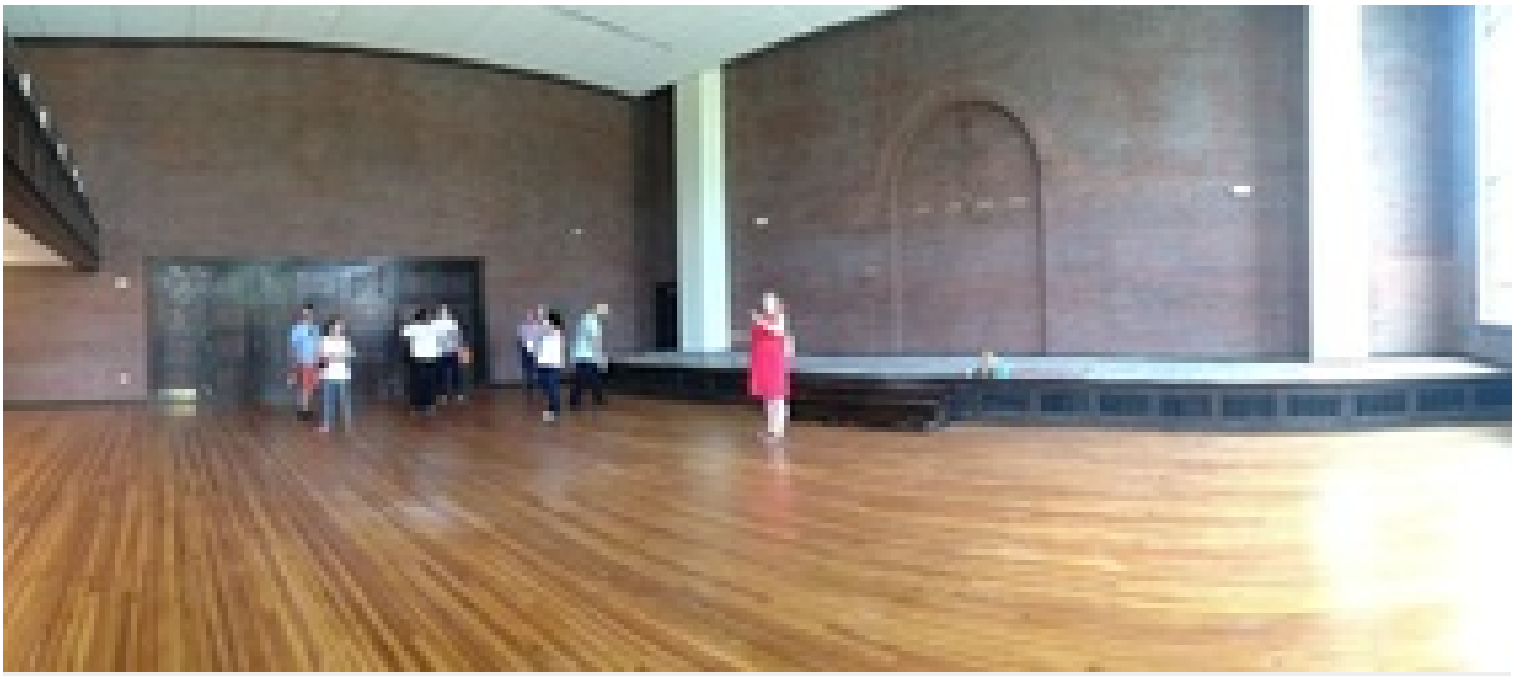

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