Regional

Roofs of our homes may be green tomorrow

Aldemaro Romero
Campus Talk

The world's energy crisis is persistent. And with more people, more consumption, and fewer non-renewable energy sources, things don't look good. Although we hear about many ideas on how to reduce our energy consumption, one we rarely hear about is the "green" roof.

A researcher who has been very successfully working on this idea is Bill Retzlaff, a professor in the department of biological sciences and an associate dean at Southern Illinois University Edwardsville.

Retzlaff was born in Pensacola, Fla., and had an interest in trees from an early age. He earned his bachelor's and master's degrees in forest management from Auburn University in Alabama. He then went on to obtain his doctoral degree in forestry from Clemson University in South Carolina.

Although the concept of green roofs sounds like a new fad, the fact of the matter is that green roofs is an idea that has been around for centuries.

"When North America was settled, even houses in this area were built with sod roofs, and on the top of the houses there was the sod from the prairie which provided the homes with a roof that was insulating and could deliver storm water," explained Retzlaff.

Since then a lot of research has been carried out, and today there is a whole international industry working around the green roofs concept. Retzlaff is one of the world's leading scientists working on this new technology. But exactly what is a green roof?

"It is a living plant system on the roof of a building," Retzlaff said. "We try to provide some ecosystem services to the top of buildings."

Green roofs, Retzlaff added, can help save money in energy costs while also providing other services, such as water and even recreational space.

There are two major types of green roofs: intensive and extensive.

"A roof is a difficult place to work with," Retzlaff said. "In a normal roof, you want to keep the water out, but with the green roofs you need to keep the water. An extensive green roof is a shallow ecosystem designed to carry rather small plants while storing water for them.

"An intensive green roof can even have trees and has much deeper soil. Some of them are used also for recreational purposes such as the one on the Chicago City Hall."

Although it sounds like a great idea, the first question that comes to mind with new technologies is cost. Because you need to use water-proofing membranes specially engineered to hold the plants, "you are talking about between $11 and $35 per square foot," Retzlaff said.

Normally houses need to have their roofs replaced every 20 or 30 years. Green roofs, however, can last up to 100 years.

"Every time that you extend by 10 years the life of a roof by making it green, you can outweigh the cost," added Retzlaff.

SIUE photo

Bill Retzlaff works on one of his green roof projects.

In addition to the cost savings of not having to replace a roof as often, there are also a number of financial incentives to go green with your roof.

"In St. Louis and Indianapolis, if you capture storm water, you don't have to pay storm water fees," Retzlaff said. "There are also tax breaks like in the state of New York where you can save up to $10,000 in taxes. The city of Chicago gives grants to offset the cost of installation."

Where does the United States stand in terms of green roof development in comparison to other countries? "Germany is well ahead since they started a long time ago," said Retzlaff. "Today between 10 and 15 percent of constructions in that country have green roofs. Although we are behind, the rate of growth in the U.S. is increasing rapidly."

Retzlaff has been responsible for developing several examples of green roofs on the SIUE campus.

"We began in 2004 with a green roof project in the engineering building. Students voted for a fee for the Student Success Center that has a green roof. Other buildings on campus also have green roofs and the plans for new academic buildings include green roofs," Retzlaff said.

The idea is now catching on elsewhere thanks to the research that Retzlaff and his students have been doing. Last year they exposed some of those experimental roofs to winds of up to 140 miles per hour to show that the designs could withstand such wind forces. This ability has now become the industry standard for green roofs.

The types of plants that can be used on green roofs depend upon the local climate.

In southern Illinois, for example, where you can go from extreme cold in winter to extreme heat in summer, Retzlaff uses native species such as sedum.

"Roofs are like deserts," explained Retzlaff. "Hot, dry, and with infrequent water. Green roofs must match the environmental conditions of the place."

Retzlaff's research has been widely funded and includes work by many of his students. "My students see not only the unlimited possibilities of this technology, but also get really engaged in these projects because I am teaching them things via hands-on experiences," he said.

Aldemaro Romero is the Dean of the College of Arts and Sciences at Southern Illinois University Edwardsville. His show, "Segue," can be heard every Sunday morning at 9 a.m. on WSIE, 88.7 FM. He can be reached at College_Arts_Sciences@siue.edu.