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# Palmetto State shows off its power

By Jason Spencer
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PATRICK COLLARD | Order a reprint
Dr. Arden Bement, National Science Foundation director, left, talks with Steve Foulger, material science and engineering associate professor, center, and Congressman Bob Inglis, R-S.C., during a tour of the Clemson Research Center on Thursday.

COLUMBIA -- The panels were off. U.S. Rep. Bob Inglis, R-S.C., peered and poked and prodded into what looked oh-so-boring on the outside.

Inglis was enamored with the stationary fuel cell that used hydrogen to at least partially power a building -- a complex, actually, and a large one at that, complete with student living facilities and a learning center.

The University of South Carolina-Columbia's "green dorm" was a small but integral piece in a showcase provided for National Science Foundation Director Arden Bement Jr. over the past two days.

Bement heard about ultraviolet optoelectronics and fifth-grade math and science. He gave the state a pat on the back on his way out, praising advances in hydrogen-based technology, philosophical and social science research and the backing of corporations such as BMW in the state's automotive cluster.

Bement said he sees the future in the Palmetto State, which he believes will be a center for technological development -- especially in the arena of hydrogen-based energy.

And he got an inside look at one such project, inspecting the green dorm's power source.

Natural gas flows into it, generating hydrogen to travel through a stack of plates that make up the fuel cell. Once inside, electricity is created to power interior lights and heat water used in kitchens and bathrooms. Invisible steam escapes through the top.

The contraption runs about $65,000 -- plus about $15,000 a year in maintenance costs, which primarily amounts to an annual fuel cell replacement.

Inglis couldn't get enough.

He's only seen it about a million times before.

"Oh, yeah, he's a regular visitor," a nearby professor laughs.

It was an adult science fair.

No tomato-sauce volcanoes. No Styrofoam dioramas of the universe. Mostly, it was just a bunch of suits talking.

Friday was a chance to hobnob with Bement, who was in the state to check on his group's sizeable investment here, and to learn about new and ongoing research.

He says he liked what he saw.

Introduced as "the nation's first (and largest) eco-sensitive facility for undergrads," the West Quad complex includes four buildings -- including the green dorm -- and has grass on one rooftop, solar panels on another, its own irrigation system, and low-pressure showerheads, faucets and toilets.

It uses up to 49 percent less energy and up to 29 percent less water than comparable facilities. Its success has convinced USC to strive for environmentally friendly buildings in its future expansions.

Inglis, who sits on the committee that approves the National Science Foundation's funding, hosted the

West Quad visit on Friday, wrapping up the tour that included Clemson University and a Mauldin Elementary School and ended atop the green dorm. Literally.

Clemson, Bement said, was "becoming one of the top research facilities in the country." And he believes the juxtaposition of research and private investment at that school's International Center for Automotive Research in Greenville will "greatly improve … opportunities for technological advancement."

But Bement, in his comments to school officials, also planted seeds -- pointing out upcoming funding opportunities the National Science Foundation will offer.

It's the kind of suggestion you write down and remember. And probably act on.

"One little nod from him in the whole (grant application) review process -- people are human, you know -- will affect those reviewers," Inglis said.

It was a time for the schools to show off foundation-funded projects, and let those officials in on other projects that could use some financial assistance.

"We're hoping he'll go back and remember one or two or three of the wonderful things we're doing," said Harris Pastides, USC's vice president for research. "And that he'll remember us as one of the places on the map."

In the past 20 months, the National Science Foundation has funded $18.3 million worth of projects at USC.

In all, that group is funneling more than $216 million into various active projects at South Carolina businesses and institutions.

Most of that has been divvied up between the Naval Electronics Systems Engineering Center in Charleston (about $77 million), Clemson University (about $53 million) and the USC Research Foundation (about $35 million).

Bement and his colleagues seemed especially interested in USC research into the societal and ethical impact of nanotechnology -- How do you regulate something that changes a material on a molecular level? How do you anticipate conservative arguments that such manipulation is best left to God? -- and programs that encourage minority doctoral candidates and future researchers.

The combined presentations carried an overall theme of evolution.

"This is a cultural change, if you want to think about it this way. There was a time in the '70s and '80s where we were teaching students, and it was research for research's sake. This is about focusing on innovation," said John Van Zee, director of the school's National Science Foundation-funded Fuel Cell Center.

"We're interested in capturing imaginations, and maybe fuel cells can do that for the next generation of scientists and engineers."

The school's Fuel Cell Program was the centerpiece of Friday's stop.

Inglis sees that program as one ingredient in a larger concoction. But all of them can be found in the Palmetto State, he said.

"South Carolina is a small enough state that if we get our act together and cooperate, we've got a real story to tell about our role in the hydrogen economy," he said. "Put it all together, and you've got something to sell."

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