

Georgia Tech's Strategic Energy Institute's Conference



Georgia Tech Executive Vice President-Research Steve Cross listening to former U.S. Secretary of Energy Ernest Moniz at the conference.

BY STEVE MITNICK, PUF EDITOR-IN-CHIEF



UF attended the Georgia Tech Strategic Energy Institute's conference on April 4, entitled INTERSECT: Energy, Policy and Innovation. Here's a peek at the conference and an interview we did with Tim Lieuwen, the Strategic Energy Institute's executive director, and Rich Simmons, a senior research engineer and fellow.

PUF's Steve Mitnick: What were you trying to do at the conference? Were you able to achieve some of those goals?

Tim Lieuwen, Georgia Tech: At Georgia Tech, we stood up the Strategic Energy Institute in about 2004. So, I think Georgia Tech was the first major research institution to really make an effort to integrate its very broad diverse energy portfolio.

The idea is that it's a complex multidisciplinary challenge. Universities, like other organizations, typically struggle to break down stovepipes and discipline specialties.

So, the idea was to try to be a cross-cutting organization. I took over this role in 2012. But basically, the job of our Energy Institute is to be a systems integrator for the energy work at Georgia Tech.

Our energy research and development footprint has the scale of a national lab. We have about one thousand people working on energy research and development. We have about two hundred, what I would call faculty principal investigators. And then a very large army of researchers and Ph.D. students and post-doctoral fellows and visiting scholars.

They are leading projects for the federal government, for industry, for foundations. We have about a hundred twenty million-dollar a year research and development portfolio.

Georgia Tech is the largest engineering school in the country, and has a significant spectrum of work in electricity, power generation, chemical engineering, earth and atmospheric sciences, for example. We also have a pretty robust presence just in energy policy, geopolitics of energy, and business sustainability as well.

Those are all areas where we have very strong portfolios with significant federal programs and significant industry partnerships. We have a number of start-up companies that have come out of Georgia Tech. It's a pretty deep and wide ecosystem.

PUF's Steve Mitnick: What makes it like a national lab? What's really distinctive about it?

Tim Lieuwen: First of all, no one player is going to solve the energy challenge. We're all on the same team.

I would say that it's a strategic partnership. I spend a good chunk of my time developing strategic partnerships. Georgia Tech has a lot of convening power for senior industry people, and that's basically a result of us really working closely with our key partners. Both federal and industrial. This big energy problem is going to take a village.

What makes us distinctive is we have a very pragmatic, can-do culture here at Georgia Tech. Although it's not just an engineering school, I'd say that the engineering background at Georgia Tech

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is a very pragmatic, problem-solution oriented culture.

And I think that plays nicely towards energy challenges. There are very well defined challenges around cost, affordability, security, and environmental impact of energy.

PUF's Steve Mitnick: Who are these one thousand people that are involved?

Tim Lieuwen: Two hundred of them are the principal investigators. These are professors and senior faculty who run research programs. The remainder would be visiting scholars, post-doctoral fellows, research scientists, and graduate students.

They're scattered across electrical engineering, mechanical engineering, chemical engineering, aerospace engineering, business, economics, policy, and international affairs. And we're a state school, so economic development and public service are very important to us.

It's a major part of our mission. We also work pretty closely with our economic development arm, as well. That means working with state partners. Also, really working hard to commercialize technology. Either through large companies or through Georgia Tech startups.

PUF's Steve Mitnick: Is Georgia Tech going to be making major breakthroughs for the serious energy challenges that we have?

Tim Lieuwen: Georgia Tech is a major leader, particularly I would say, for our science and technology breakthroughs in energy. And I can give you a couple of quick examples.

The largest U.S. photovoltaic manufacturer in the United States is a company called Suniva. That's a Georgia Tech spinout. It's a result of a very strong partnership between Georgia Tech and the Department of Energy over twenty years.

It's managed by a Georgia Tech faculty member who we see



Southern Power's CEO Buzz Miller mixing at a break.



Georgia Tech's EVP Steve Cross with EPRI's CEO Mike Howard.



Southern Company's CEO Tom Fanning speaking while fellow panelist Craig D'Arcy of Home Depot listens.

every day. He's here doing research but he also has this company which is selling solar panels around the world.

I would say the area of carbon capture is another significant area where we see important breakthroughs. We have major Department of Energy programs, and major partnerships with a lot of the oil and gas companies. And that would be capturing carbon, either from power plants or from what's called direct air capture.

Another area where we've made a significant impact in the industry would be the multi-disciplinary systems design. For how power systems are operated.

Particularly now I'm talking about manufacturers. How do you develop procedures for designing a really complicated system? Thinking about it from a systems point of view. Thinking about risk, thinking about cost, thinking about all the different kinds of risk.

So, a lot of the approaches, which are now thoroughly embedded in industry, spun out of Georgia Tech. Those are three examples.

We want to see the cool science and technology that we're doing improve water quality for people around the world, reduce electricity prices, make the grid more stable.

Rich Simmons, Georgia Tech: Another way of saying it too is we're leading in the fundamental research, but part of the idea of the conference was to develop the bypass to commercialization for some of these things.

So that's where these original equipment manufacturers like GE and Ford, as well as the utilities, and the conversation about what makes a good policy, are critical to get all these wonderful innovative ideas actually into the market. That's one of the major goals of the Strategic Energy Institute, one of the things that distinguishes it.

PUF's Steve Mitnick: Isn't it always the hard part to get to commercialized technologies, and get them to scale, and get them to where consumers, whether business or individual consumers, will buy and use them?

Rich Simmons: You're absolutely right. Finding how to incentivize capital to flow into these opportunities amid some of the policy uncertainty. But that's where we felt like a focus on something with more definitive regional boundaries could be useful, because then the investments have more direct tangible impacts in our region and with our stakeholders.

PUF's Steve Mitnick: After I went home, there was a lot more work done, building off of the conference. Can you say something about that?

Tim Lieuwen: We came up with four framing questions.

Those are big questions. If we can answer those questions, that's a major impact. We will be sending out to all the attendees our first stab at this is what we heard, and some insight into addressing those questions.

And we're going to be asking for everyone's input and feedback before we publish a final findings document from the conference. Rich is heading a new center at Georgia Tech that we're calling the Energy Policy and Innovation Center. And the idea was that this conference was going to serve as a broader backdrop for a much more intensive working session to bring out the roadmap for that new center.

Rich Simmons: That's actually what happened on the second day that you're referring to.

PUF's Steve Mitnick: How did you two get into these roles?

Tim Lieuwen: I've been a faculty member here at Georgia Tech for sixteen years. My background is combined-cycle power plants. I've had this role for the past four years. When I first started this job, it was very obvious that Georgia Tech is a science-technology powerhouse.

I think for us to further have impact, we need to be working on what does it mean for technology innovation, which we're very good at. How do we better intersect that with policy innovation and with business model and business process improvement?

Again, our mission, particularly as a state school, is to improve society. We want to see the cool science and technology that we're doing improve water quality for people around the world, and reduce electricity prices, or make the grid more stable.

I think all that stuff flowed into a recognition that we're going to have to up our game in terms of better coordinating. Both within our own organization, again thinking about how do we better tie in with economics and policy, but also with some of our key stakeholders – utilities, NGOs, public service commissions.

This is work we've been doing at Georgia Tech for the last four years. Really making a push to better tie those together. And then this conference, with the idea to really try to even take that to the next level, and have a bigger conversation with a bigger group.

Rich Simmons: My route was different. I spent about



Strategic Energy Institute's Tim Lieuwen and Mary Hallisey Hunt on either side of Southern Company's CEO Tom Fanning.



Strategic Energy Institute's Tim Lieuwen addressing the conference.

seventeen years in industry. Primarily in automotive research and development, but also energy systems. And then did a little stint as well with the government, working on energy policy for about three years.

I saw that Georgia Tech wanted to develop more of an outward facing systems engagement, especially on the policy side. So that brought me here about a year ago, and set up a great partnership. [PUF](#)