

“A New Era of Innovation”
REMARKS BY GEORGIA TECH PRESIDENT G. WAYNE CLOUGH
GE Power Systems Lunch, December 9, 2003

It is an honor and a pleasure to join with the College of Management in welcoming GE Power Systems to Technology Square.

GE is one of Georgia Tech’s closest and most active corporate partners, and we work together in a variety of ways. In the one-on-one category, we are proud of Mike Neal, a Georgia Tech graduate who heads up GE Capital and who serves on several advisory boards here on campus. Also, your CEO John Rice serves on Georgia Tech’s Advisory Board. At the other end of the spectrum, we have a broad based collaborative program with GE Power Systems on a range of research and development programs, and at any given time, Georgia Tech has some 25 master’s degree students in engineering from GE Power Systems enrolled through a formal arrangement with the company.

We are now looking forward to working with you in this new expression of our ongoing partnership as we work together to provide key career and skills enhancements for top middle managers to better understand innovation and the management of change.

When Executive Education Director Dan Stotz invited me to join you for lunch today, he suggested that I talk about the new era of innovation that lies before us, and some of the ways that Georgia Tech is reaching out to participate in it and take advantage of the opportunities it presents. I was glad to address the topic not only because of what is going on at Georgia Tech, but also because this topic is central to efforts I am involved with at the U.S. Council on Competitiveness and the President’s Council of Science and Technology Advisors.

Over the past several decades we have been witnessing the gradual emergence of an integrated global economy that is changing the rules of the game. It began with a shift of low-skill manufacturing jobs to low-wage countries. Then the Internet began to provide instant access to information and opened the door to inexpensive global communications, which accelerated the process of globalization.

We are seeing rapid productivity gains being implemented in manufacturing plants in such a way as to reduce workforce needs in high tech areas of the economy such as semiconductors. Productivity in the manufacturing sector has been steadily rising, beginning in 2001 and strengthening through 2002 and 2003. Over the same timeframe,

1.3 million jobs have disappeared, some in the form of outsourcing to other global competitors, but in others cases to automated processes. We now are beginning to hear a new catch phrase called “lights out” plants – plants that are so totally automated that there is no need to keep the lights burning.

Superimposed on the productivity trend is the movement of customer service and technology jobs to places like India and China, as these nations develop skilled workforces and build modern network infrastructure. In a country where the average per capita income is only \$460 a year, top engineering graduates from Indian Institutes of Technology consider themselves well paid at \$10,000 a year. But this is obviously only a fraction of the pay scale for their counterparts in the United States and Europe.

Large corporations have responded to skilled labor at such bargain prices by sending jobs overseas. By some estimates there are now more IT engineers in Bangalore, India, than in Silicon Valley. By 2008, McKinsey forecasts that back-office jobs in India will have increased five-fold, employing 4 million people and accounting for 7 percent of India’s gross domestic product. While this is good for India and raises its standard of living, it presents a challenge to the U.S. and its standard of living. We need to better understand these trends and ensure that we can compete in this new environment.

GE, for example, has 1,800 engineers at the Jack Welch Technology Center in Bangalore. A quarter of them have Ph.D.s, and they are engaged in fundamental research for most of GE’s 13 divisions. The center just opened in 2000, and has already filed for 95 U.S. patents. Georgia Tech is presently collaborating with GE to lay the groundwork for a distance learning master’s degree program in Bangalore, and we expect the first group of GE employees to enroll next fall.

The growing migration of technology jobs to places where the cost is much cheaper is a clear signal that it is no longer possible to compete on cost alone. There is always somebody somewhere else who can do it more cheaply than you can. The competitive advantage has now shifted to a higher level, and the key to success is innovation. We are on the cusp of an era in which the most important driver of economic well-being will be innovation.

More specifically, innovation refers to ideas, expertise, insight, and opportunities to exchange them and collaborate across the lines of industries and academic disciplines. The result is the invention of new products and services and that ultimately translate into the creation of new businesses and jobs.

To compete based on innovation, you have to have both the expertise and the opportunities to exploit new ideas at a pace that is more rapid than your competitors. You have to have a steady progression of new ideas, and this is done by a new process of interdisciplinary collaboration that bypasses the old stovepipe methods. Such a shift is challenging, but it is also an opportunity to those willing to make the right investments.

The economic leaders of the 21st century will be the companies and the nations that offer the most fertile, attractive environment for innovation anywhere in the world. Creating that environment requires superior education systems that produce both a cadre of talented and creative researchers in science and engineering and a world-class workforce with up-to-date knowledge and skills. It requires a regulatory framework that encourages new knowledge to grow and venture capital to fund the commercialization of new ideas. And it requires an ongoing dialog among government policy makers, industry leaders, and higher education to bring their respective resources and agendas into strategic alignment.

Over the course of the next year I am going to join with Sam Palmisano, who is chairman, president and CEO of IBM, in co-chairing a National Innovation Initiative on behalf of the U.S. Council on Competitiveness. The two of us are putting together a Principals Committee of 20 distinguished CEOs, university presidents, and labor leaders to help with this task. And we have invited Jeff Immelt of GE to serve on this committee.

We will be gathering input from seven working groups, with each of them addressing a specific topic – such as the frontiers of innovation, the skill sets required by an innovative economy, investment capital to feed innovations, public sector innovation, markets, and innovation-friendly public policies. We plan to hold a series of regional meetings followed by a national summit a year from now in December of 2004. Our goal is to examine what it takes to keep our nation's innovative capacity in top form, so we can capitalize on and commercialize the coming new waves of technologies.

One important element of innovation is to be on the leading edge in emerging new fields like logistics, biomedical engineering, nanotechnology, and, of course, new clean and efficient sources of energy. This requires us to be strategic about investing in research in these emerging fields, and that is the goal of the President's Council of Advisors on Science and Technology.

Annual federal funding for nanotechnology research, for example, is approaching \$1 billion. It is spread across ten federal agencies and passes through several different

congressional committees. As a member of PCAST, I am serving on a panel that is working on behalf of the President and Congress to provide oversight and coordination of these resources. And they are growing. I was in Washington last week and met with President Bush just after he signed the “21st Century Nanotechnology Research and Development Act,” which authorizes \$3.8 billion in federal funding to be budgeted for the National Nanotechnology Initiative.

So we have a clear signal that the White House is aware of the importance of innovation and is willing to devote an increased level of funding for the research to generate it. But it is essential that we also address the other elements required to create an environment where innovation can thrive. And the goal of the Council on Competitiveness Initiative on Innovation is to develop and national agenda that will serve as a blueprint for that task.

Now, how does all of this relate to Georgia Tech, and how are we as an Institute helping to create that innovation-friendly environment? First, we are engaged with the world in ways that are unique in higher education. Universities have traditionally been somewhat monastic in nature – cozy and comfortable within the confines of their own campuses. While major corporations like GE and GE Power Systems have been international entities for years, most universities – even major research universities – have remained focused on one campus at one location, and their international activities have tended to consist of study abroad programs and offering advice to other universities.

At Georgia Tech, we have moved beyond that model. Our goal is to become one of the world’s few truly international universities, with full-fledged physical platforms at strategic international locations where we engage in education, research, and economic development in partnership with other universities, government, and industry in those places.

Georgia Tech now has four campuses on three continents. In addition to this one in Atlanta, we also have campuses in Savannah, Georgia; Metz, France; and Singapore. These are not merely study abroad facilities; they offer full academic and research platforms and grant Georgia Tech degrees to students who never set foot in Atlanta.

Georgia Tech-Lorraine in Metz, France, is the oldest of our international campuses. It has been offering graduate degree programs for more than ten years and has now begun an undergraduate program. It has well-established research programs in collaboration with industry, and has begun to spin off new companies. Georgia Tech-Lorraine gives us a physical base from which to build partnerships with European

corporations and universities, such as the Technical University of Munich, with which we are developing a joint degree program.

Singapore, of course, is the world's hub for logistics, which is a field in which Georgia Tech has ranked first in the nation for many years. So logistics is the focus of our research and education programs there, which represent a partnership with the National University of Singapore. But we will be expanding into other areas as well.

We are also growing our research and education enterprise, especially in those leading-edge fields I mentioned – logistics, biotechnology, nanotechnology, and energy. Within the past few years we have opened two new biotechnology facilities, and we have funding commitments from the state and a private donor to build a \$80 million Nanotechnology Research Center that will put us at the forefront of this sweeping new field.

We are also working to smooth out the often-bumpy path from the research lab to the commercial marketplace. We created VentureLab, which keeps an eye on the research underway in Georgia Tech's many laboratories, helping to identify discoveries with commercial potential and guiding the development of that potential to the point where new ideas are ready for incubation at ATDC – the Advanced Technology Development Center – which is one of the nation's most respect technology business incubators.

ATDC is located right across the street from us here in this new Georgia Tech development we call Technology Square. Technology Square is a literal expression of what we do at Georgia Tech on many levels. It is designed to be an intersection of innovation – a place where ideas and expertise come together and interact, generating innovation. In addition to ATDC, Technology Square is the new home of our Management programs, which, as you have already discovered, offer expertise in innovation and the management of change. It also houses the Economic Development Institute and the Technology Square Research Building.

These entities now have a wonderful presence right on the edge of the campus, where they are surrounded by Atlanta's growing high-tech business community. Our goal is to incorporate our faculty, staff, and students into the economic pulse of the city and the state, and to collaborate in multiple but coordinated ways in promoting the development of a signature high-tech business corridor for Atlanta.

At the same time, Technology Square also provides an international intersection of innovation through the sophisticated communication and teleconferencing capabilities

of the Global Learning and Conference Center, linking Georgia Tech's far-flung campuses and opening the door to exchanging ideas with the rest of the world.

We are pleased to have GE Power Systems here at Technology Square today, and we look forward to serving you through the executive education program of our College of Management. This program will provide an opportunity for learning that will generate the expertise and ideas that will help create an environment where innovation can thrive.

The world's energy needs are increasing by leaps and bounds even as the conservation of our natural environment calls for us to be more sensitive about how we provide that energy. At the same time, exciting discoveries and new fields like nanotechnology hold promise for innovative new technologies that can solve our energy problems and meet our energy needs. GE Power Systems is positioned to move our generation and use of energy into a new era of innovation. Georgia Tech is proud to be your partner, and pleased to work together with you in preparing for that new era.