



Georgia Tech Strategic Energy Institute

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Creating a Clean, Sustainable Energy Future: SECURE, RELIABLE, AND ECONOMICALLY VIABLE ENERGY OPTIONS

Georgia Tech Energy Innovations

The Strategic Energy Institute's scientists, engineers, and scholars are leading game-changing discoveries that are shaping the way we live and work, and developing better ways to meet the energy needs of today and tomorrow.

Electric Energy Transmission, Distribution, and Utilization

The U.S. electrical grid is the largest, most complex power generation and distribution network in the world, consisting of nearly 7,000 power plants and more than 3 million miles of lines and associated equipment. Georgia Tech researchers are working to develop advanced communications and information systems, sensing and control technologies, transmission, and energy storage technologies that will make our power transmission and distribution system cleaner, more efficient, and cost-effective. Research is also focused on enabling greater integration of renewable energy sources and electric vehicles.

Solar, Thermoelectric, and Energy Storage Materials

Georgia Tech researchers are exploring new energy storage materials and systems that will enable utilization of new energy supply options, such as those from intermittent renewable resources. Research spans a wide range of lightweight, cost-effective, and high-energy density storage

devices such as batteries and supercapacitors, and energy conversion technologies for solar cells, fuel cells, and thermoelectric devices.

Thermal Energy Systems

Georgia Tech's thermal energy research is focused on understanding and exploiting thermal phenomenon to: achieve better energy management, design more energy-efficient systems and processes, improve utilization of renewable energy, and reduce pollution. Research ranges from energy system technologies, electronics thermal management, and manufacturing processes to fundamental research in thermal energy transport and fluid dynamics.

Catalysis and Separations Technologies

Traditional methods for fuel and chemical conversion consume considerable amounts of energy in the form of heat or electrical power. Georgia Tech researchers are working to develop clean, affordable, and sustainable energy resources through a wide range of advanced catalytic and separations technologies. Research addresses challenges related to fuel and chemical synthesis, energy conversion and storage, and treatment of waste and environmental contaminants.

All-Encompassing Expertise

Georgia Tech brings a breadth and depth of energy expertise that addresses:

- All aspects of the energy life cycle – from raw materials to primary energy generation, distribution, and the disposal/recycling of energy-use byproducts.
- System-level challenges – advanced combustion science and engineering, alternative fuels and renewable energy systems, energy information and communication system integration.

- Near- and long-term challenges – from immediate challenges faced by industry and policymakers to long-term planning and business models for a low-carbon economy.
- Projects on a broad range of scales – from the household level to the city, regional, national, and global levels.

- Georgia Tech is home to the first:
- U.S. Department of Energy University Center of Excellence in Photovoltaics Research and Education
 - Electric energy research, testing, and evaluation center consortia
 - U.S. Department of Energy-sponsored Energy Frontier Research Center in Georgia
 - Plastic solar cell



Fossil fuels have driven decades of economic development and progress. With rapidly expanding global populations and growing environmental concerns, low-cost, clean, secure energy solutions will be necessary to address our global energy needs and sustain our way of life.

Changing the Way We Live and Work

Founded in 2004, the Strategic Energy Institute connects, coordinates, and cultivates Georgia Tech resources toward the development of a clean, secure, and sustainable energy future. The Institute serves as a hub for promoting open dialogue, greater understanding, and solution-based thinking around solving our greatest energy challenges.

From improving the technologies for conventional and renewable energy sources to exploring their environmental, economic, and policy impacts on the world, the Strategic Energy Institute is working beyond traditional research boundaries to address our global energy challenges on multiple fronts.

