



***Advancing Economic Development
Through Innovation in Energy Technology***

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Executive Director
Georgia Centers of Innovation

April 2017



Aerospace



Agribusiness



Energy
Technology



Information
Technology



Logistics



Manufacturing

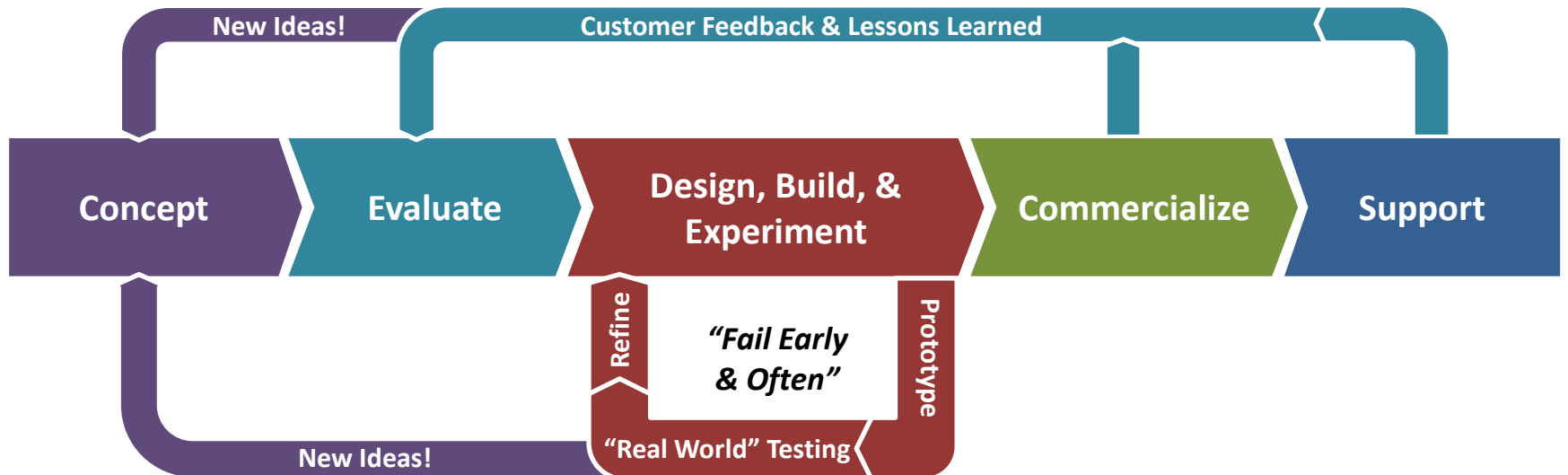


a division of the Georgia Department of Economic Development

What Is Innovation?

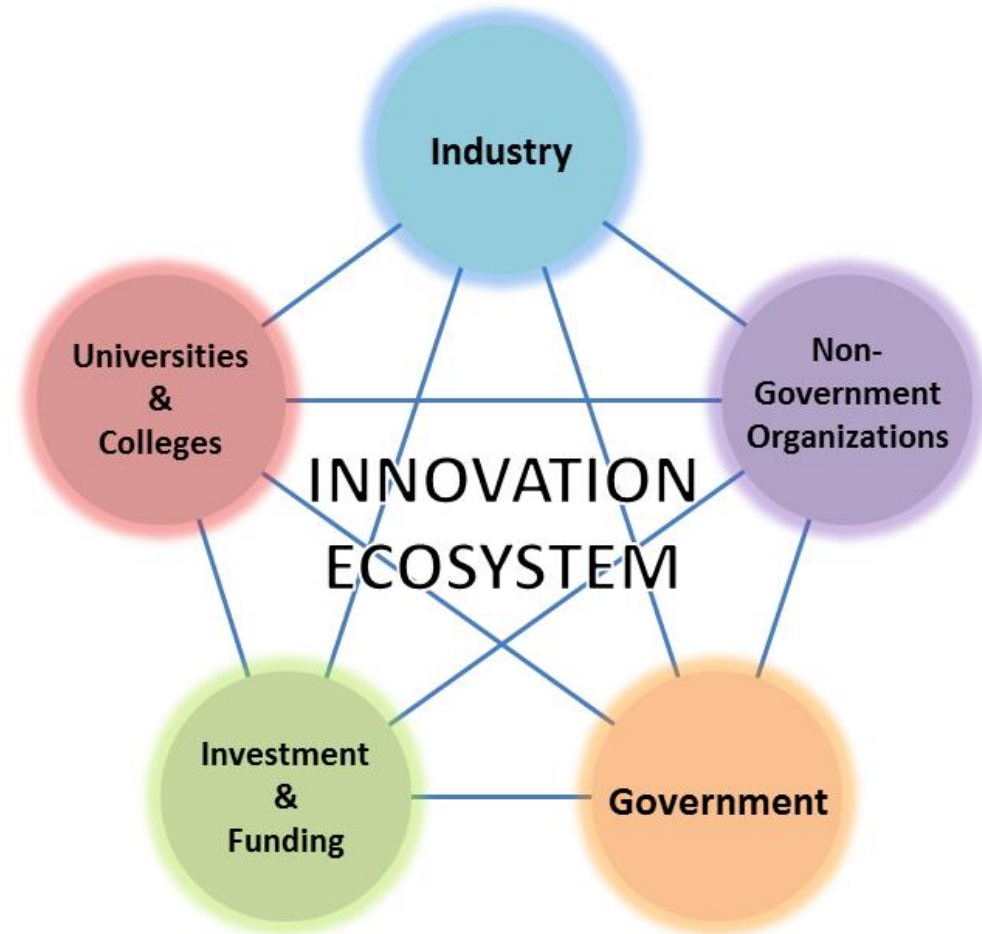
INNOVATION: The process of translating an idea or invention into a good or service that creates value or for which customers will pay.

- **Evolutionary Innovations** (continuous or dynamic evolutionary innovation) that are brought about by many incremental advances in technology or processes.
- **Revolutionary Innovations** (also called discontinuous innovations) which are often disruptive and new.



Georgia's Centers Of Innovation Connecting To The Innovation Ecosystem

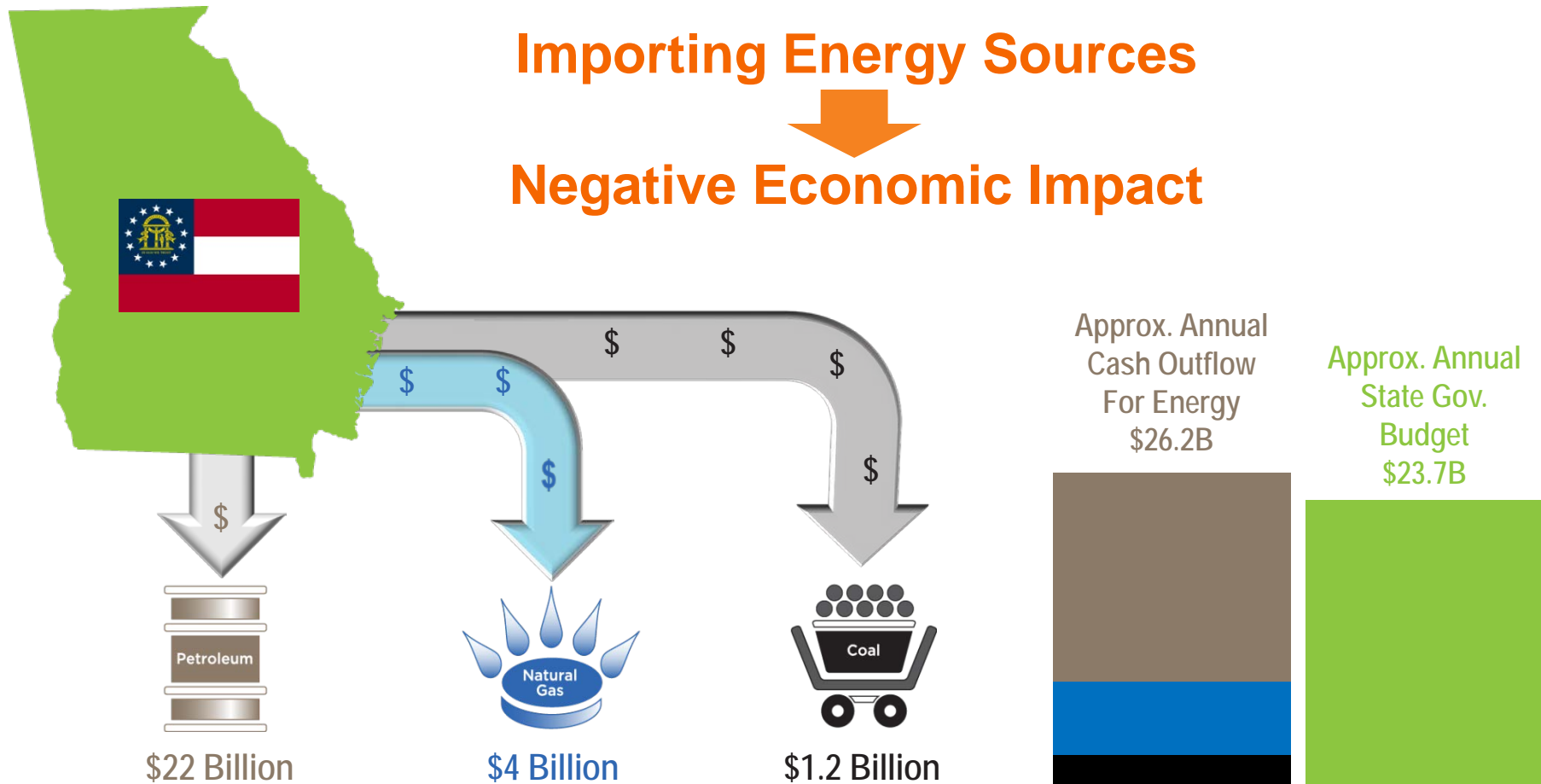
- The **Centers of Innovation** are **“solution integrators”** connecting companies to the vast resources of Georgia's Innovation Ecosystem through:
 - Technical Industry Expertise
 - Collaborative Research
 - Partnerships



Energy Technology

\$\$\$ Outflow for Fossil Fuels

Importing Energy Sources
↓
Negative Economic Impact



(Source: US Energy Information Administration 2014-2015)



Energy Technology

Georgia's Sustainable Energy Ecosystem



**Reducing Energy
Consumption
&
Localizing Energy
Sources**

↓

**Positive Economic
Impact**



Energy Technology Research in Georgia's Universities

- Georgia Research Alliance  Georgia Research Alliance
 - University of Georgia
 - Georgia Institute of Technology
 - Georgia State University
 - Augusta University
 - Clark Atlanta University
 - Emory University
 - Mercer University
 - Morehouse University
- Other Engineering Research Universities
 - Georgia Southern University
 - Kennesaw State University



~\$1 Billion in University Research Annually

(Source: National Science Foundation)



Georgia.org/Innovation



Energy Technology Research in Georgia's Universities

- Georgia Research Alliance Eminent Scholars Program
 - Recruiting world-class scientists to Georgia universities (60+ currently)
 - Investing in state-of-the-art research technology for university labs
 - \$595 million state investment leveraged into \$3.8 Billion total investment
- Georgia Research Alliance Venture Fund
 - Fueling the commercialization of university-based discoveries and inventions
 - Multi-phase commercialization grants & Low-interest loans
 - Over \$1 billion in equity investment, launched more than 150 active companies

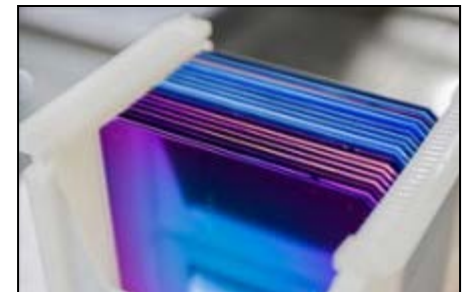
GRA Eminent Scholars in Energy and Environmental Engineering:

- [Dr. John Crittenden](#) - Georgia Tech - Brook Byers Institute for Sustainable Systems
- [Dr. Depak Divan](#) - Georgia Tech - Center for Distributed Energy
- [Dr. William Koros](#) – Georgia Tech - Membrane & Sorbent Research
- [Dr. Ajeet Rohatgi](#) – Georgia Tech - Center of Excellence in Photovoltaics Research and Education
- [Dr. David Sholl](#) – Georgia Tech - Chemical and Biomolecular Engineering
- [Dr. C. J. Tsai](#) – University of Georgia - Biofuels



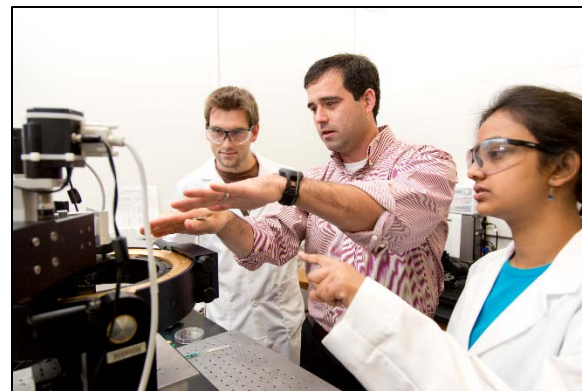
Energy Technology Research in Georgia's Universities

- Georgia Tech
 - [Strategic Energy Institute](#)
 - [Carbon Neutral Energy Solutions Laboratory](#)
 - [Center for Innovative Fuel Cell and Battery Technologies](#)
 - [Center for Organic Photonics and Electronics](#)
 - [Clean Combustion Research Center](#)
 - [Energy Information & Policy Center](#)
 - [Intelligent Power infrastructure Consortium](#)
 - [National Electric Energy Testing, Research and Applications Center \(NEETRAC\)](#)
 - [University Center of Excellence for Photovoltaics Research and Education](#)
 - [Center for Energy and Geo Processing \(CeGP\)](#)
 - [Brook Byers Institute for Sustainable Systems](#)
 - [Georgia Tech Research Institute: Energy & Environment](#)
 - [Renewable Bioproducts Institute](#)



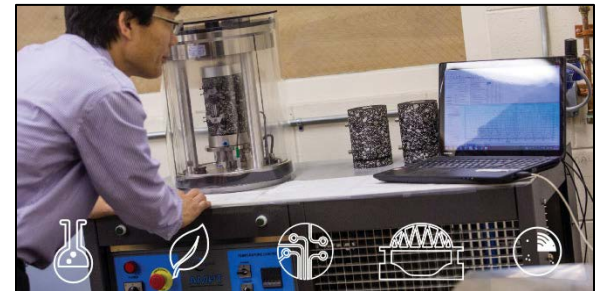
Energy Technology Research in Georgia's Universities

- University of Georgia
 - [College of Engineering Research](#)
 - Biomass conversion
 - Biofuels
 - Bioenergy
 - Energy Conservation
 - Energy Production
 - SmartGrid
 - Smart Buildings
 - Solar Energy Resource Assessment
 - Sustainable Energy
 - Wind Energy Resource Assessment
 - [New Materials Institute](#)
 - [Center for Integrative Conservation Research](#)
 - [Georgia Initiative for Climate & Society](#)
 - [Innovation Gateway](#) for technology transfer



Energy Technology Research in Georgia's Universities

- Georgia Southern University
 - [Center for Innovative Technology, Manufacturing and Engineering Solutions \(CITEMS\)](#)
 - Combustion Engine Design, Development, and Instrumentation
 - Wind Energy Harvesting
 - Biofuel Development and Characterization
 - Wireless Propagation Modeling
- Mercer University
 - Engineering Research Program
 - [Advanced Generation Technologies](#)
 - [Engineering for Development](#)
 - [Mercer Engineering Research Center \(MERC\)](#)



Energy Technology

Advancing Economic Development

- Solar Energy – A Growing Segment
 - Approx. 3,000 new jobs in Solar Industry
 - \$2B in Capital Investment in the State
 - Approximately 1.4 GW of Solar
 - Top 10 Solar Portfolio in USA
- Electric Vehicles - Almost 20,000 sold in Georgia
 - [EV Charger infrastructure](#) expansion
 - [Electric Buses](#) – Blue Bird school bus project
- Clean Tech Industries
 - 800+ companies with 19,000+ jobs
 - \$3B+ in annual revenues
 - New Battery Technology - [sonnen Innovation Hub](#)
 - Smart Grid applications



Energy Technology

Advancing Economic Development

- Waste Streams as a Resource
 - [Database of waste streams](#) by COI-Energy with Georgia Environmental Protection Division to connect waste streams to potential users
 - [Grubbly Farms](#) waste to feed project
- Environmentally Controlled Agriculture
 - #1 industry in Georgia - \$73B+ economic impact
 - Waste-to-Energy serves enclosed growing facilities to expand industry into non-traditional high value crops
 - Agricultural waste cycled back into energy system
 - COI assisting local companies including [Phytosynthetix](#) & [Replantable](#)



Georgia's Centers Of Innovation

Center of Innovation for Energy Technology



Focused on:



Energy Generation



Energy Storage



Energy Consumption



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Director

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Georgia energy firms can accelerate the development of new energy solutions with assistance from the Georgia Center of Innovation for Energy Technology. The Center is the state's key resource to create, connect and grow Georgia's energy ecosystem.



Georgia.org/Innovation





Georgia's Centers of Innovation
www.Georgia.org/Innovation

**Helping Georgia's Industries to
Connect, Compete, and Grow
in the Global Marketplace**



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