



South Carolina Innovation Plan 2013

Recommendations for Accelerating the Knowledge Economy in the Palmetto State

South Carolina Department of Commerce
Research Division
February 4, 2013



Innovation is the central issue in economic prosperity.

- Michael Porter

Introduction

Innovation is the process by which individuals and organizations generate new ideas and put them into practice. Innovation is best fostered in an economy that recognizes intellectual assets and knowledge resources, in addition to material resources, as key components of a strong economic foundation. Such “innovative economies” open up new opportunities for entrepreneurship and business growth, accelerate productivity of existing industries, and raise the standard of living. Indeed, those states, cities, and regions that have successfully nurtured and embraced an innovative economy (e.g. Silicon Valley, Boulder, Austin, Research Triangle Park, Boston) continually lead the nation in several critical areas: productivity, patents issued, per capita income, employment rates, research and development (R&D) share, number of federal SBIR/STTR grant award recipients, business financing opportunities, technology employment, wage premiums, and new company formation.

An innovative economy does not exclusively focus on small high-tech, high-growth businesses; large manufacturers and R&D labs operated by prominent, multinational corporations also play a vital role in developing an innovative and entrepreneurial spirit. Such “anchor firms,” with their advanced products processes and technical talent, benefit from and contribute to the ecosystem of entrepreneurship by providing opportunities for technical collaboration, commercialization, and participation within

their supply chains. Large industry anchors such as GE Energy, BMW, Boeing, Michelin, and Milliken, among many others, interact with the state’s colleges and universities to help drive fundamental research efforts and coordinate on training and education to prepare the innovative workforce they need. Furthermore, an innovative economy also has the ability to increase the capabilities of small manufacturing and service firms to improve existing production models and launch more marketable and profitable products.

This report serves as a road map to strengthening the development of South Carolina’s innovative economy, which is essential to ensuring South Carolina’s long-term economic competitiveness and improving the standard of living for all citizens of the Palmetto State. The recommendations contained in the report are intended to grow South Carolina’s innovation economy in both the short term (2-5 years) and the long term (5 years and beyond). In order to ensure sustainable development of the state’s innovation capacity, South Carolina must continue to prioritize improvements in K-12 education, STEM higher education, and the South Carolina Research Enterprise. These upstream research endeavors are critical to developing downstream product development and commercialization. The state Science and Technology Plan addresses these priorities.

Innovation is the specific instrument of entrepreneurship...
the act that endows resources with a new capacity to create
wealth.

- Peter Drucker

Steering Committee

The South Carolina Innovation Plan was drafted with valuable input from the plan's steering committee:

Robert Hitt	SC Department of Commerce, Co-Chair
Bill Mahoney	SCRA, Co-Chair
Michele Abraham	SC Small Business Development Centers
Chris Desoiza	Milliken & Company
Bill Kirkland	USC/Columbia Technology Incubator
John Kelly	Clemson University
Dirk Brown	Faber Entrepreneurship Center, USC
Jerry Callahan	ISI Technologies
Steve Johnson	CreatiVasc Medical LLC
Ben Wall	WJ Partners
Robert Fletcher	Governor's School for Science and Mathematics
George Fletcher	New Carolina
Steve Lanier	Medical University of South Carolina

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The five essential entrepreneurial skills for success are concentration, discrimination, organization, innovation, and communication.

- Michael Faraday

Background

In addition to input from the plan's steering committee, several entities were consulted to help identify opportunities and challenges for the growth of South Carolina's innovative economy. Many of these entities represent a diverse mix of institutions that play a vital role in the state's current and future economic success. Other institutions, such as out-of-state universities and venture capital firms, provided valuable insight into the strengths and opportunities for developing South Carolina's innovation ecosystem. Entities consulted include:

Azalea Capital	Nelson Mullins	The Iron Yard
Bauknight, Pietras and Stormer	New Carolina	UCAN
BB&T	Nexsen Pruet	USC/Columbia Incubator
BCI Lending	NEXT Innovation Center	USVP
CED	Nexus Medical	Vanderbilt University
CETi	Noro Mosely	Watermark Advisors
Charleston Digital Corridor	Panorama Capital	Webster Rogers
First Federal Bank	SBDC	WJ Partners
Frontier Capital	SC BIO	WRSequence
Innovista	SCRA	Wyche Law Firm
InvestSC/JEDA	Silicon Valley Bank	Several Small & Medium Sized Businesses
Knowledge Sector Council	Square 1 Bank	Several "Anchor Firms"

Representatives from these entities each held a unique opinion on how to advance South Carolina's innovative economy, but two broad themes were consistently observed:



There are no old roads to new directions.

- Boston Consulting Group

Theme 1: South Carolina should focus its efforts on advancing high-tech firms in those industries with high-growth potential.

South Carolina is home to a diverse array of industries. Motor vehicle and transportation equipment manufacturing, metal and machinery manufacturing, computer and electronic product manufacturing, food and beverage production and chemical manufacturing are the dominant sectors within the manufacturing industry. New Carolina, which has served as the state's organization for cluster development since 2003, has activated fifteen clusters in the state: advanced security, agribusiness, automotive, aviation and aerospace, life sciences, composites, creative, textiles, TDL (transportation, distribution, and logistics), engineering, hydrogen and fuel cells, insurance technology, nuclear, recycling, and tourism. South Carolina should focus its efforts and resources on trying to help stimulate growth in those industries in the state that have the most high-growth potential.

Theme 2: South Carolina must nurture a robust innovation entrepreneurial climate.

Places like Silicon Valley, Research Triangle Park, and Austin, Texas can all be defined by an innovative culture – innovators and entrepreneurs are celebrated, investors are willing to take risks in technology start-ups, students are encouraged to pursue STEM degrees, inter- and intra-industry/university collaboration is the norm, economic development incentives are applicable to high-tech firms of all sizes, and a wealth of resources, in addition to capital, are available for innovators to utilize. Stakeholders do not perceive that such a culture exists in South Carolina. South Carolina's economic incentives are geared toward large firms that create numerous direct jobs. Such incentives do little to incent existing firms into investing in R&D and are not always applicable or of interest to high-tech firms. There is no single state agency charged with advancing the innovation economy, making it difficult for innovation entrepreneurs to know whom to turn to for assistance.

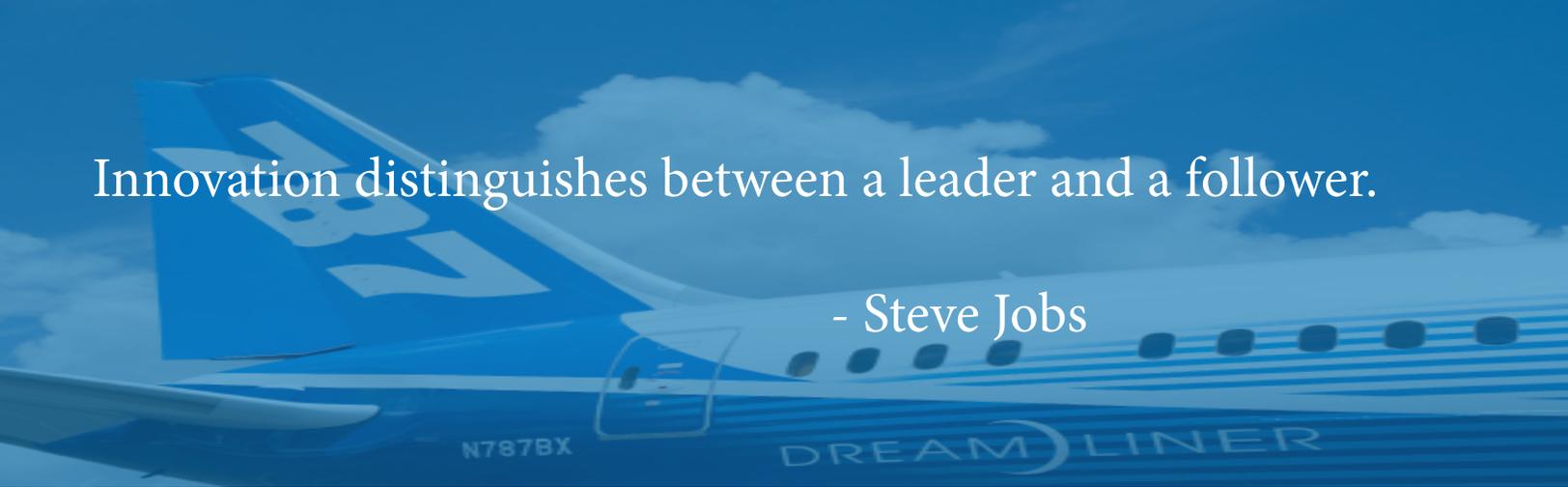
We live in a society where technology is a very important force in business, in our daily lives. And all technology starts as a spark in someone's brain.

- Nathan Myhrvold

In addition to consulting these stakeholders, a survey (The South Carolina Capital Market Study) was conducted of CEOs and senior management from more than 100 privately held, high-growth potential firms with a South Carolina headquarters. Survey respondents were predominately smaller firms with high expectations of growth; evenly split between manufacturing, traded services, and local services. Most of the respondents could be considered technology firms, either in the development of advanced products or services. About two thirds of survey respondents generate less than \$5 million in sales and about 60% of all respondents received more than half of their revenues from out-of-state sales. Key findings from The South Carolina Capital Market Study indicated that:

Theme 3: Start-ups have limited access to capital in South Carolina.

The capital markets have tightened dramatically in South Carolina and the rest of the country. Over 70% of respondents indicated that it was “extremely difficult” or “difficult” to secure financing for commercializing a new or improved product; over 60% indicated the same about securing financing to acquire another firm, expanding into new product markets, and expanding exports; and, over 50% indicated the same about securing financing for a planned exit strategy, expanding facilities, restructuring existing debt, and expanding into new geographic markets. But capital still exists in South Carolina. Approximately 85% of respondents believed that sources of equity capital suitable for their business may be available in South Carolina, but they are hard to find. Approximately 65% of respondents believed that sources of debt capital suitable for their business may be available in South Carolina, but they are hard to find. However, funding for growing and mature companies in the form of venture capital is nonexistent in South Carolina. Respondents also indicated that developing clusters and networks of anchor customers is essential to demonstrating viable markets for innovative products and services to potential investors.



Innovation distinguishes between a leader and a follower.

- Steve Jobs

Several stakeholders and respondents to The South Carolina Capital Market Study also indicated that:

Theme 4: South Carolina must develop the managerial and technical talent necessary for innovation to thrive.

The state's current workforce and workforce training programs do not meet the needs of high-tech firms. South Carolina has a very low concentration in computer and mathematical professionals and ranks below Georgia, North Carolina, and Alabama for the percent of its workforce employed as computer programmers, software developers, database administrators, information security analysts, and web developers. The same is true for experienced biosciences experts. The state also lacks individuals who have successfully secured venture capital funding and commercialized technology. Existing workforce development programs in South Carolina, such as readySC™ and Apprenticeship Carolina™, are geared towards preparing workers for a resources driven economy. Building a cadre of technical experts and senior executive mentors with experience scaling later stage companies is critical to advancing long-term entrepreneurial success.

To accomplish great things, we must not only act, but also dream; not only plan, but also believe.

- Anatole France

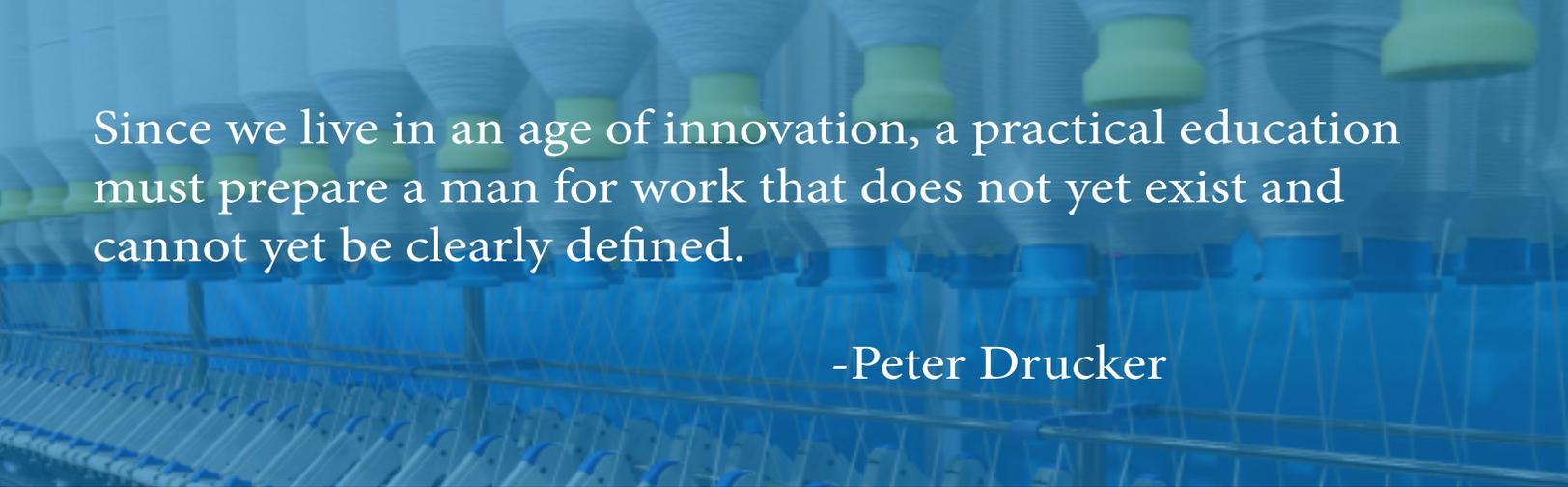
Developing an Innovative Economy

Based on input provided by stakeholders and the results of The South Carolina Capital Market Study, South Carolina can best advance an innovative economy by embracing and committing to achieving the following five goals:

Goal 1: Develop a critical mass of high-tech firms in targeted clusters. The stronger the concentration of high-tech firms in South Carolina, the higher the probability that a single high-tech firm will develop into a global industry leader and the higher the likelihood that a single tech firm’s advancements will positively advance all related firms in the state. Developing a critical mass of high-tech industries will have several positive economic impacts, including: boosting innovation, improving wages, improving employment opportunities, stimulating regional entrepreneurship, aiding diversification of industry participants, and improving regional sustainability. In order to accomplish this goal South Carolina should focus its efforts and resources on stimulating growth in four core competencies: the Transportation, Distribution, and Logistics Cluster, the Digital Media and IT Cluster, the Advanced Materials Cluster, and the Advanced Manufacturing Cluster. Stimulating growth and activity in these clusters will lead to growth across the various vertical industries shown below that form the backbone of South Carolina’s economy.

		Vertical Industries							
		Transportation		Energy	Environment and Sustainability	Life Sciences and Agriculture			Insurance
		Automotive	Aerospace			Biomedical	Pharma	Biotech	
Core Competencies	Advanced Manufacturing	More Intense	More Intense	More Intense	More Intense	More Intense	More Intense	More Intense	More Intense
	Advanced Materials (Composites, Textiles, etc)	More Intense	More Intense	More Intense	More Intense	More Intense	More Intense	More Intense	More Intense
	Digital Technologies (IT Media)	More Intense	More Intense	Less Intense	More Intense	More Intense	More Intense	More Intense	More Intense
	Transportation, Distribution, Logistics	More Intense	More Intense	More Intense	More Intense	More Intense	More Intense	More Intense	More Intense

Degree of Focus
Less Intense More Intense



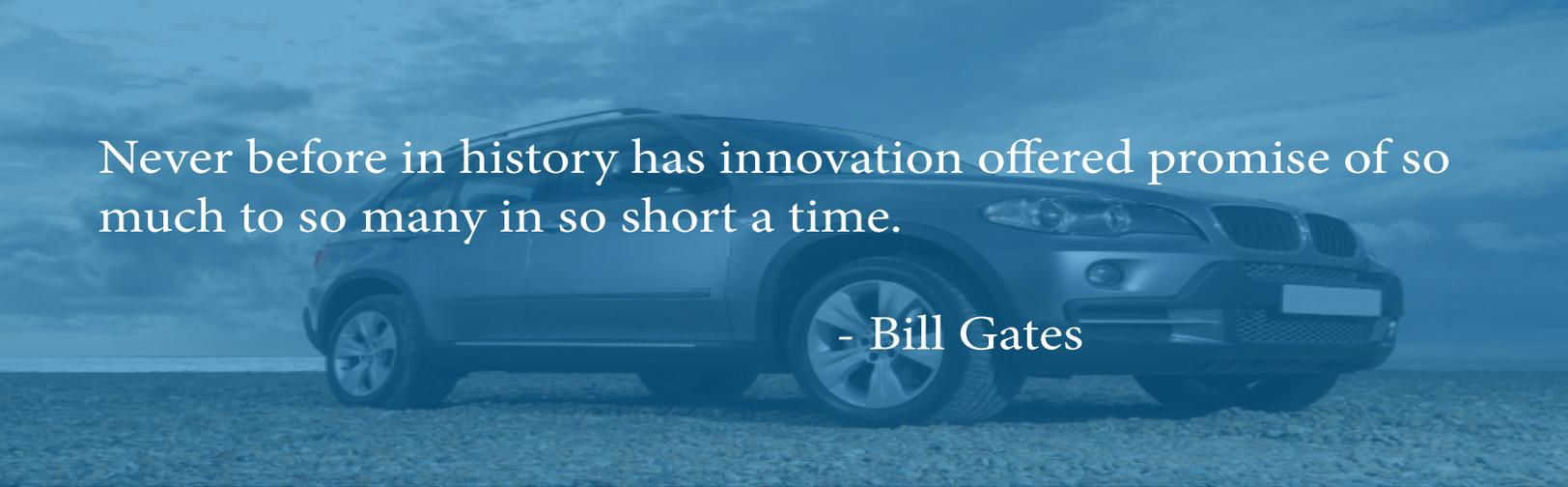
Since we live in an age of innovation, a practical education must prepare a man for work that does not yet exist and cannot yet be clearly defined.

-Peter Drucker

These four clusters have significant high-growth potential and are the most likely clusters in South Carolina from which high-tech startups, spin-offs, and supply chain innovation for anchor firms are likely to arise. Benchmarks to achieving the goal of developing a critical mass of high-tech firms in targeted industries include: increasing the number of workers employed in the high-tech industry, increasing the median wages for workers in the high-tech industry, increasing the number of technology firms recruited to South Carolina, and increasing the visibility of South Carolina's technology firms.

Goal 2: Ensure that South Carolina's innovation community is well-connected with ample opportunities for networking. A challenge faced by innovators is making connections within the innovation community. This is especially challenging for South Carolina's innovators – the state's population of 4.6 million is geographically dispersed across the state. Columbia, the state's most populous city, has a population of just under 130,000 people. The result of this dispersion is that innovators tend to only network within their geographical region. Increasing the connectivity of the state's innovative community and potential investors should lead to an increased awareness of funding opportunities and increased opportunities for collaboration. Benchmarks for achieving this goal include: increasing the visibility of resources available to and relevant to entrepreneurs and increasing the opportunities for geographically dispersed entrepreneurs, technical experts and investors to network.

Goal 3: Ensure that entrepreneurs have adequate access to funding for all stages of business development. Perhaps the largest obstacle faced by innovators is securing necessary capital to help transform their ideas into marketable products or technologies. South Carolina continually underperforms the nation and peer states in attracting key sources of capital for innovators. This obstacle is amplified in South Carolina due to a deficiency of both seed capital for business start-ups and venture capital funding for more mature companies. Benchmarks for achieving this goal include: increasing the number of venture capital firms with a physical in-state presence, increasing the number of in- and out-of-state venture capital firms investing in South Carolina businesses, increasing the amount of venture capital funding available to entrepreneurs, increasing angel investments, and increasing R&D investments.



Never before in history has innovation offered promise of so much to so many in so short a time.

- Bill Gates

Goal 4: Ensure South Carolina’s workforce is equipped with the skills and knowledge that tomorrow’s high-tech companies will require. Innovation has been and will continue to be an engine of economic growth in South Carolina. Advancements in innovation derive from an ample and well-educated workforce, composed of technically-skilled professionals with post-high school degrees, educators with advanced degrees, and K-12 teachers of mathematics and science. Benchmarks for achieving this goal include: increasing K-12 student achievement in STEM fields of study; increasing the number of STEM graduates from South Carolina universities; and increasing collaboration between innovators, technical experts, and entrepreneurs.

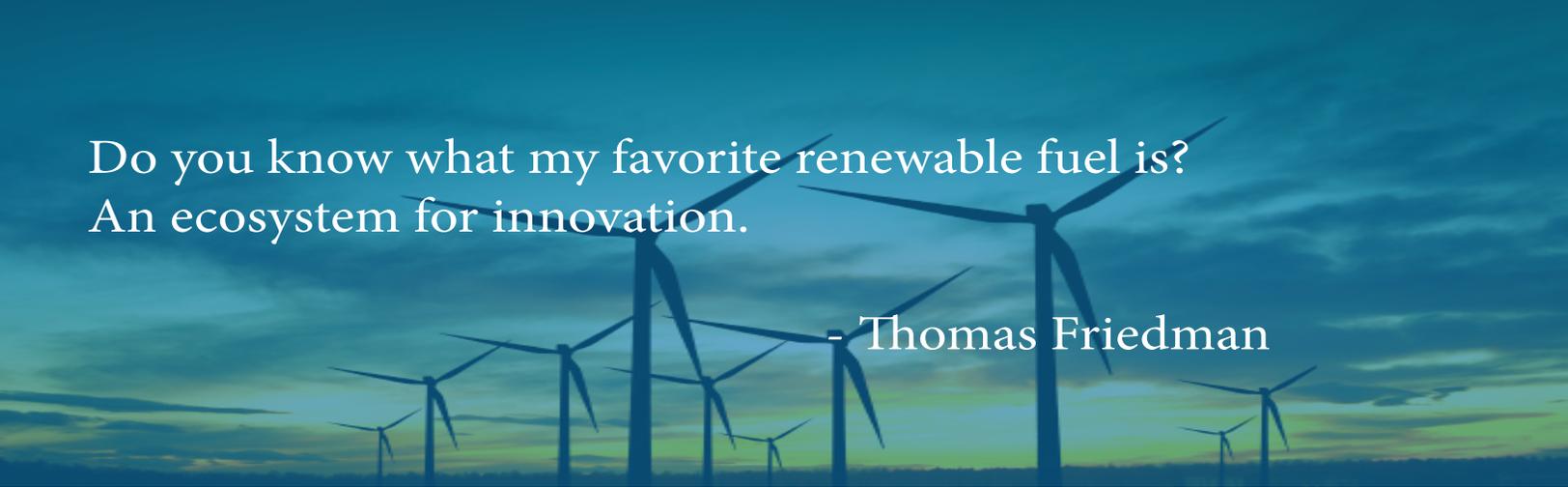


Innovation accelerates and compounds. Each point in front of you is bigger than anything that ever happened.

- Marc Andreessen

Recommendations

The following pages contain recommendations on steps that South Carolina can implement to achieve these five goals. These recommendations were drafted after consulting with various stakeholders and after a thorough review of best-practices from all other states, with particular attention paid to those states that are at the forefront of advancing innovation and entrepreneurship. All of the policies proposed in this plan are cross-cutting, addressing multiple goals simultaneously. Because they are cross-cutting, each of these policies has the potential to positively impact South Carolina's knowledge economy in significant ways. However, the economic benefit of several of these policies does not capture each policy's full social benefit. These recommended policies, if enacted, will advertise to the rest of the country that South Carolina supports its innovative community. This support should lead to more innovators and high-tech firms migrating to South Carolina and help spur in-state entrepreneurial interest.



Do you know what my favorite renewable fuel is?
An ecosystem for innovation.

- Thomas Friedman

Recommendation 1: Prioritize innovation and entrepreneurship development activities at the South Carolina Department of Commerce.

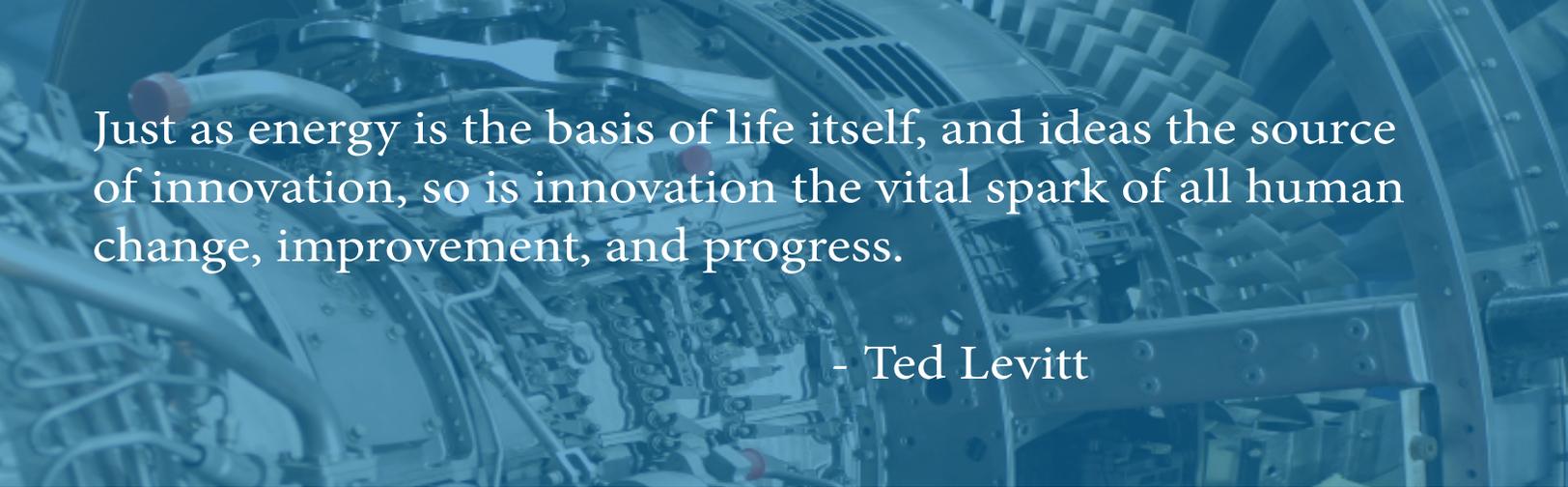
Allocate resources within the Department of Commerce to promote the growth and development of innovative, R&D-intensive firms of all sizes in South Carolina. The Commerce Department's initiative to facilitate innovation and entrepreneurship should be supported by multiple stakeholders, including SCRA, Clemson University, The University of South Carolina, and The Medical University of South Carolina. The Department of Commerce's activities to support entrepreneurship and technology-based economic development should include:

- **Establish an Office of Innovation:** Explore the creation of an Office of Innovation within the Commerce Department. Modeled after the Office of the Chief Scientist in Israel and its technology offices, the Office of Innovation will assist in the development of technology in South Carolina as a means of fostering economic development, encouraging technological innovation and recruitment, leveraging the state's scientific potential and existing knowledge base, and encouraging R&D collaboration. The office will also coordinate and spearhead implementation of the state's Innovation Plan and Science and Technology Plan.
- **Facilitate High-Tech Industry Recruitment and Expansion:** Serve as a dedicated high-tech concierge who addresses the needs of high-tech firms of all sized in South Carolina and coordinates the state's recruitment of high-tech firms. Facilitate access to markets and capital for existing high-growth, high-tech South Carolina businesses.
- **Establish South Carolina Centers of Innovation Excellence:** Establish Centers of Innovation Excellence that are aligned with the needs of South Carolina's core competencies. These Centers, modeled after the Fraunhofer Centers throughout Europe, will serve the state's economic development by combining applied research with specialized teaching and targeted outreach to solve current industry challenges. Each Center should serve the needs of a specific cluster by leveraging multiple stakeholders in academia, business, and government to conduct applied research that speaks to the cluster's most pressing challenges, develop cluster-relevant undergraduate/graduate coursework, and organize workshops on topics of critical importance to the state.

The best way to predict the future is to invent it.

- Alan Kay

- **Connect South Carolina’s Innovation Economy:** Establish forums for connection, both online and physical that: (1) enable entrepreneurs and innovators to find experts and assets within South Carolina’s research institutions; (2) showcase South Carolina start-ups and direct users to SEC-approved crowd-funding websites where those businesses are fundraising; (3) connect rural entrepreneurs; and (4) identify existing resource providers and capital sources within South Carolina. Establish an incubation network that: includes (5) an Incubation Association for directors of business incubators to share best practices and (6) a Statewide Virtual Incubator that expands the networking opportunities of incubated companies in similar fields and industries beyond their local region.
- **Promote Innovation and South Carolina as an Innovation State:** (1) Develop a marketing campaign to promote South Carolina to out-of-state investors and entrepreneurs, to internally spark interest in innovation, and to educate business owners on opportunities available to help them start and grow their businesses. (2) Work with small manufacturing and service firms to implement a culture of innovation in the workplace to help improve productivity. (3) Establish an annual innovation award and business plan competitions for high-tech firms. (5) Sponsor an “innovation traveling speaker series.”
- **Improve Technology Transfer:** (1) Work with existing university technology transfer offices to vet, bundle, and proactively market the technologies available for commercialization from all of South Carolina’s research institutions. (2) Work with universities to establish curriculum that encourages STEM students to take classes in the school’s entrepreneurship program and to host conferences that introduce students and faculty to the process of technology commercialization.
- **Support an Innovative Economy:** Ensure South Carolina is fostering a diverse entrepreneurial economy by annually reviewing and updating the state’s Science and Technology and the Innovation Plans, as well as coordinating the implementation of both plans.



Just as energy is the basis of life itself, and ideas the source of innovation, so is innovation the vital spark of all human change, improvement, and progress.

- Ted Levitt

Recommendation 2: Create a nation-leading business environment for the growth and attraction of high-tech firms of all sizes.

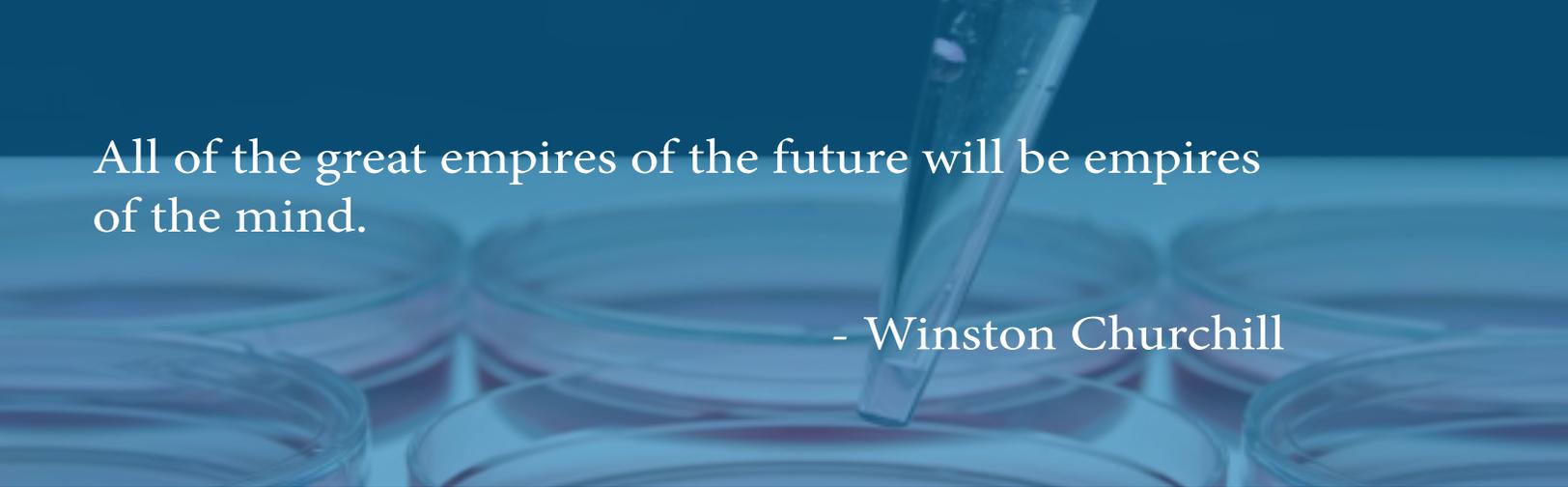
In order to grow and attract high-tech firms, South Carolina must enact a new set of economic development incentives or modify existing incentives. South Carolina can effectively create a nation-leading business environment for the growth and attraction of high-tech firms of all sizes by enacting the following policies:

- **Innovative Jobs Investment Act:** Establish a tax credit for angel investments, with a credit enhancement for technology investment priorities. The credit should have an annual contribution limit of at least \$7.5 million and the credit should be allocated on a first-come-first-served basis. Georgia's angel investor tax credit is equal to 35% of the amount invested in a start-up with an annual contribution limit of \$10 million. North Carolina's angel tax credit is equal to 25% of the amount invested in a start-up with an annual contribution limit of \$7.5 million. Both states cap the maximum individual tax credit at \$50,000.
- **Corporate R&D Tax Credit Enhancement:** South Carolina's current corporate R&D tax credit applies only to corporate income tax liabilities, which are often very small for firms that predominately trade outside of the state. South Carolina adopted a single-factor corporate income tax apportionment method in 2010. Corporations that do not pay state corporate income tax should be allowed to claim qualified R&D expenses in the state as a credit against monthly withholding payments, a policy already in place in Georgia. Enhancing South Carolina's current R&D tax credit in this manner would make the credit competitive with neighboring states and lead to the attraction of more R&D investments and jobs.
- **Encourage Institutional Venture Capital and Private Equity Investment:** Allocate a portion of funds from the South Carolina Retirement System fund to invest directly in South Carolina-based firms or in venture capital firms mandated to invest in South Carolina-based firms.
- **SCRA Industry Partnership Fund Enhancement:** Raise the annual funding cap on the Industry Partnership Fund from \$6 million to support the continued growth and success of the SC Launch program. The SC Launch program fills a critical gap in the funding of early-stage companies that often license intellectual property from the state's research institutions.

Learning and innovation go hand in hand. The arrogance of success is to think that what you did yesterday will be sufficient for tomorrow.

- William Pollard

- **Incubator Support:** Award state funding to business incubators for workforce training and program development specifically in support of active clusters and high-growth potential companies. Such funding should be allocated based on a proven record of graduating companies and resulting employment growth.
- **Securities and Regulations Alignment:** With passage of the 2010 Frank-Dodd Act, private equity firms may face increased regulations and registration requirements, depending on implementation by state law. South Carolina should ensure that the state's securities and regulation encourages the growth of South Carolina-based private equity firms and hedge funds.
- **High-Tech Jobs Tax Credit:** Enhance existing jobs tax credits to encourage the relocation and expansion of high-tech firms in the state by providing corporate income tax credits or credits against withholdings for technology-based businesses that pay above-average wages.



All of the great empires of the future will be empires
of the mind.

- Winston Churchill

Conclusion

South Carolina has already made tremendous progress in advancing an innovative economy. Indeed, South Carolina has developed numerous exemplary programs including SCLaunch, the SmartState Endowed Chairs Program, Clemson University's International Center for Automotive Research (CU-ICAR), and several successful business incubators. However, the state must do more to attract technology firms and build a culture of entrepreneurship and innovation capable of growing high-impact firms that are critical to employment and wage growth in the state. The policies proposed in this report will propel the growth of South Carolina's knowledge economy by increasing the state's appeal to innovators at the helm of high-tech firms and by improving the state's already favorable business and regulatory environment for manufacturing and service firms of all sizes.