New Carolina
South Carolina’s Council on Competitiveness

private leadership in economic development
Acknowledgments

In 2010, the U.S. Economic Development Administration selected the Institute for Strategy and Competitiveness (the ISC) at Harvard Business School, directed by Professor Michael E. Porter, to lead the U.S. Cluster Mapping Project. The ISC selected New Carolina as a regional partner for the project. This report is one of the products of that collaboration. New Carolina would like to thank its many statewide partners for supporting the development of this report: South Carolina Chamber of Commerce, South Carolina Department of Commerce, South Carolina Department of Transportation, South Carolina Ports Authority, South Carolina Research Authority, South Carolina Economic Developers’ Association, Upstate South Carolina Alliance, Charleston Regional Development Alliance, Darla Moore School of Business at the University of South Carolina, South Carolina Manufacturers Alliance, Palmetto Institute, Carolinas’ Nuclear Cluster, Creative Industries Cluster, Palmetto Agribusiness Council, EngenuitySC, RecyclonomicsSC, and SCBIO. New Carolina also wishes to thank the Monitor Group for additional support. The opinions contained in this report are those of the authors and New Carolina, and do not necessarily reflect the views of the U.S. Economic Development Administration or any other partner of the U.S. Cluster Mapping Project.
New Carolina
Private Leadership in Economic Development

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Executive Summary

This report on the New Carolina initiative is a study on how private sector leaders in South Carolina embraced the cluster development concept to upgrade their region’s competitiveness. It provides insights into their motivation, explains what they did, discusses the impact they have had, and lays out the key lessons learned. It also displays real-world examples of how cluster-based economic development works as part of modern economic policy at the regional level. This Policy and Impact Study is the third in a series of four developed as part of the U.S. Cluster Mapping Project, an effort supported by the U.S. Economic Development Administration.

Historical Economic Development and the Challenge to Change

South Carolina is facing a critical challenge to its traditional mode of competing as a place to do business. For nearly 50 years, from the 1950s to the early 2000s, state policymakers used an economic development strategy that centered on attracting manufacturers to the state with its flexible workforce, business-friendly environment, and responsive government. Low-wage, low-tax incentives enhanced South Carolina’s agricultural and textile manufacturing base. From 1950 to the early 1980s, per capita income in South Carolina rose nearly 400 times in real terms and increased to nearly 80 percent of the national average. But from the 1980s to the early 2000s, per capita income stagnated at this 80 percent level. South Carolina began to see a rise in competition from other countries due to its low-wage, low-tax incentive strategy, which saw the departure of the state’s textile manufacturing base. In spite of this stagnation, economic development used the same recruitment strategies as in the past.

It was in the late 1990s and early 2000s that business leaders began to look for new approaches to transform South Carolina’s economy. The recruitment of BMW to upstate South Carolina in 1992, the loss of the textile industry to overseas locations, and the recognition of the importance of the South Carolina Ports Authority to the state’s economic health triggered a new discussion of how South Carolina should compete in the increasingly global economy.

While the loss of textile manufacturing to foreign competition made embracing globalization difficult, many stakeholders recognized that the Port of Charleston could drive both the inflow of foreign direct investment and the outflow of exports, and enable globalization to have a net positive impact on the state. With a new vision of where South Carolina could sit in the global market, business leaders searched for a new model of economic development that could direct the focus of traditional industry recruitment.

The South Carolina Council on Competitiveness – New Carolina

In 2003, several of South Carolina’s key business and civic leaders launched the South Carolina
Competitiveness Initiative, which aimed to bring together relevant stakeholders from around the state, assess the competitive position of South Carolina, examine existing clusters in the state, and build consensus on a shared economic strategy for South Carolina. This collaboration resulted in the 2005 *South Carolina Competitiveness Initiative: A Strategic Plan for South Carolina*.

The report made eight recommendations for improving the competitiveness in South Carolina:

1. Create new institutions for economic development.
2. Activate and upgrade clusters.
3. Continue to enhance education and workforce development.
4. Invest in research and the university system.
5. Launch internal and external marketing plans.
6. Create an explicit economic development program for distressed areas.
7. Increase support for startups and local firms.
8. Measure progress in raising prosperity.

In order to meet the first recommendation, The South Carolina Council on Competitiveness, a 501(c)(3) organization that later became known as New Carolina, was created to mobilize clusters and improve the business environment for better growth. New Carolina was represented by top business leaders in the state, the governor, the secretary of commerce, and presidents of South Carolina’s three research universities. The initial structure created a board of directors with 50 members and organized many others around task forces. As formal cluster organizations developed, each cluster group formed its own membership criteria and funding structure.

New Carolina initially began its work by spreading the theory of cluster development throughout the state. When it started in 2004, there was one active cluster in the state, which surrounded BMW and the Clemson University International Center for Automotive Research (CU-ICAR). As of 2013, there are 14 cluster organizations in varying stages of development and formality. New Carolina has direct management relationships with five of these cluster groups and provides various levels of support. Other economic development groups, including government agencies, also have started organizing their industry recruitment around clusters.

The second part of New Carolina’s mission—to improve the business environment for better growth—has been done through task force support. New Carolina has task forces that focus on three key factors affecting business growth and competitiveness in the state: education and workforce development, entrepreneurship, and distressed areas. These three factors are relevant to all industry clusters and to the citizens of the state.
The level of support from business leaders across the state has remained strong since the beginning. Private sector business leaders are involved because they see that this adds value to their companies. Collaborating to solve industry problems and building a voice to speak to those problems have made an impact. The level of public support from the state government has fluctuated. Initially, there was tremendous support both financially and intellectually. However, as the state felt the effects of the 2007 recession, financial support from the state government disappeared, and New Carolina became a private sector funded initiative. New Carolina cluster groups and task forces have continued to engage with state government agencies on a working level with positive results. For example, the division of the South Carolina Department of Commerce (SCDoC) that promotes recycling market development has been instrumental in the functioning of the organized recycling cluster.

It is now a new stage in the life of New Carolina, as the organization has eight years of valuable experience to share from the collective knowledge of its board of directors and cluster chairs and managers. New Carolina is again reaching out to the South Carolina legislature to tell the story of the value of cluster development. Private sector cluster leaders are able to speak about the positive impact that New Carolina and cluster development activities have had on their businesses and on the state. New Carolina has begun to bring together the various cluster groups so that they may learn best practices from one another and discuss effective measures of success for individual organizations and for the state as a whole.

**Lessons Learned**

1. **Key industry leadership needs to be engaged.** Quality involvement at both the CEO and mid-level is vital to maintaining the momentum of a cluster.

2. **State government officials need to be identified and engaged.** Access to both working-level officials with decision-making authority as well as to the highest-level state officials is beneficial to the business sector leaders as they work to make significant changes in their industries.

3. **Clusters need a focusing goal to serve as a rallying point.** Each cluster must develop new goals to move the group forward.

4. **Dedicated staffing is essential to sustain progress.** The level of structure needed requires adequate funding and private sector commitment.

5. **Not every cluster will follow the same course.** Each cluster will have its own identity just as each industry does.

6. **Clusters find value in collaboration across industries.** This develops a healthy business environment in which related industries are able to collaborate and grow.

7. **Traditional industry recruitment agencies can benefit from existing clusters.** Recruitment
agencies should be included in cluster development discussions so that they are informed about existing clusters, can target those industries, and can sell a vibrant industry cluster as an available resource.

8. **Task forces that focus on the cross-cutting factors of competitiveness are essential to improve the overall business environment.** Task forces are well suited to supporting long-term fundamental strategies that promote growth for all industries, but they need input across business sectors to succeed.

9. **Telling the story is vitally important for both cluster growth and motivation for the state.** Keeping cluster supporters informed of the organized cluster’s activities allows both the private sector and the organizing entity to reach out to policymakers.

10. **Competitiveness is global; economic impact is local.** The economic impact numbers are important to make the case for industry influence, but competitiveness is about raising expectations as a state.

**Conclusion**

South Carolina has made significant progress in the last 10 years—eight of those with the help of New Carolina. Business leaders created the organization out of concern that a focus on outside business recruitment was not sufficient for growth and prosperity in a global economy. Now when businesses are considering a move to South Carolina, recruitment agencies can use cluster development as a tool to identify existing networks of companies involved in industry and business environment growth. New Carolina leads the engagement through collaboration within industries, among cluster groups, and across the state on critical areas of focus. The result is a vibrant economy with forward-looking business leaders who collaborate with policymakers on actions to take that increase prosperity in South Carolina. Policymakers and practitioners can apply the lessons learned by New Carolina to their regions. However, each location needs to devise the right competitiveness strategy to leverage its unique mix of industry clusters and business environment conditions and, in turn, increase business growth, productivity, and new business formation.
Introduction

This Policy and Impact Study is the third in a series of four developed as part of the U.S. Cluster Mapping Project, an effort supported by the U.S. Economic Development Administration. “New Carolina” provides real-world examples of how cluster-based economic development works as part of modern economic policy at the regional level. From 1950, South Carolina was heavily rooted in textiles and low-tech manufacturing, where a flexible labor force, cheap land, and business-friendly government were attractive enough to grow a decent economy in the state. However, South Carolina began to see a rise in competition from other countries due to this strategy. In the late 1990s and early 2000s business leaders began to look for new approaches to transform South Carolina’s economy. The recruitment of BMW to upstate South Carolina in 1992, the loss of the textile industry to overseas locations, and the recognition of the importance of the South Carolina Ports Authority to the state’s economic health triggered a new discussion of how South Carolina should compete in the increasingly global economy.

This report on the New Carolina initiative is a study on how private sector leaders in South Carolina embraced the cluster development concept to upgrade their region’s competitiveness. It provides insights into their motivation, explains what they did, discusses the impact they have had, and lays out the key lessons learned.

Over the last decade, cluster practitioners have gained significant experience in how to turn industry collaboration into better government policies and competitive advantages for firms. However, much of this experience resides with the individuals and organizations that have taken a cluster-based approach to economic development. At the federal level, discussions about cluster-driven policies have long been focused on arguments as to whether cluster policies are tantamount to picking winners. This study clearly shows that real cluster development efforts do not necessarily need such interventions. The examples here make a contribution to ongoing learning about best practices for cluster-driven economic development. However, each region must devise its own strategy for competitiveness based on its clusters and other strengths.

Economic History

The post-World War II era from 1950 to 1980 was as rapid a period of growth and development for the South Carolina economy as it was for the national economy. The state’s population grew from 2.1
million in 1950\(^1\) to 3.1 million in 1980,\(^2\) an increase of nearly 50 percent, while its manufacturing employment increased by 200,000 jobs.\(^3\) South Carolina’s urban population grew from approximately 37 percent to 54 percent by 1980,\(^4\) signifying movement away from a predominantly agricultural economy. Perhaps most importantly, per capita income in South Carolina rose dramatically from 1950 to 1980, both in absolute terms and relative to the rest of the nation. In constant dollars, South Carolina per capita income grew over 400 percent, rising from about 60 percent of the national average to nearly 80 percent by 1980.\(^5\)

However, from 1980 to the early 2000s, per capita income in South Carolina stagnated at 80 percent of the national average.\(^6\) Part of the reason for this was that South Carolina continued to see a large increase in population and an influx of workers. This not only resulted in a larger economic base, but also made increases in per capita income more difficult to achieve. While population growth has been steady, employment numbers have fluctuated (see Figures 1 and 2 below).

**Figure 1: South Carolina Employment (Seasonally Adjusted), 1993-2013\(^7\)**

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This fluctuation in employment reflects how the state has struggled to find its identity in the global economy. From the 1950s to 1980s, South Carolina implemented a low-wage, low-tax model for economic recruitment. The economic base for South Carolina was heavily rooted in textiles and low-tech manufacturing, where a flexible labor force, cheap land, and business-friendly government were attractive enough to grow a decent economy in the state. With increasing globalization, however, came competition from other countries for low-wage manufacturing jobs. South Carolina saw its competitive advantage in textiles disappear as many firms closed their doors in South Carolina and moved overseas to countries such as China or across the border to Mexico.

At the same time that South Carolina watched its textile jobs leave the United States, the state became the beneficiary of globalization with the arrival of BMW’s production facility in the upstate (Greenville-Spartanburg) area. BMW’s decision to locate in South Carolina in 1992 continued to impact the state almost 20 years later when Boeing located its Dreamliner assembly plant in the Lowcountry (Charleston) region of South Carolina. In the intervening years, the state struggled with its position on globalization and opening trade with new markets. Many stakeholders blamed the opening of trade for the decline of the textile industry, but 20 years later, South Carolina ranked as one of the highest states for foreign direct investment per capita in the nation. The new textile industry, while vastly different

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8 SCPOP is the variable name used by FRED® (Federal Reserve Economic Data) for the resident population of South Carolina by year. Shaded bars indicate U.S. recessions. See http://research.stlouisfed.org/fred2/series/SCPOP. Underlying data comes from the U.S. Department of Commerce, Census Bureau.
from its predecessor, is now alive and well. Making the decision to embrace globalization put South Carolina in a position to weather the 2007 recession (see Figure 3).

**Figure 3: South Carolina Manufacturing Employment, 1990-2013**

South Carolina Today

South Carolina today has many strong assets, including the fact that it is a Right to Work state with a low cost of living and a technical college system oriented to manufacturing. Two of the state’s greatest strengths include its infrastructure and research university system, which is committed to economic development.

The highlight of the state’s infrastructure is the Port of Charleston, South Carolina’s connection to the global economy. The port is a key economic driver for the state and was ranked eighth nationally by dollar value in 2012. The 2015 widening of the Panama Canal presents the potential for significant growth of the port and the state’s economy as a whole. Linking the rest of the nation to the port is a network of five interstate highways, three airports, and two class-one railroads, with construction set to begin for an inland port (Figure 4).

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South Carolina has three research universities that focus on the commercialization of new technologies. In 2002, the state legislature established the SmartState Program™, which allowed the research universities to create centers of economic excellence to advance South Carolina’s economy. Since its beginnings, the SmartState Program has attracted more than $1.2 billion in non-state investments, has led to the creation of more than 7,000 jobs, and has assembled a “Who’s Who” list of corporate partners, including BMW, Fluor, Michelin, and SCANA.12

Today, there are nearly 50 SmartState Centers in six industry-focused “Smart Clusters” regarded as critical to the state and beyond: Advanced Materials and Nanotechnology, Automotive and Transportation, Biomedical, Future Fuels®, Information Science, and Pharmaceutical.13 These focus industries coincide with many of the industry clusters identified as areas where South Carolina has a competitive advantage.14

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12 “An Introduction to the SmartState Program™,” SmartState: SC Centers of Excellence. See http://smartstatesc.org/introduction
13 “An Introduction to the SmartState Program™,” SmartState: SC Centers of Excellence. See http://smartstatesc.org/introduction
14 See Appendix C for more information on Smart Clusters. These overlap with the industry clusters identified as strategic strengths in the Strategic Plan for South Carolina, produced as part of the South Carolina Competitiveness Initiative. See http://www.newcarolina.org/UserFiles/publications/A%20Strategic%20Plan%20for%20South%20Carolina%20by%20Michael%20Port er%202005.pdf
### Figure 5: South Carolina Employment by Traded Cluster, 2010\(^5\)

**Overall Employment Rank = 25**

<table>
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<tr>
<th>Rank in U.S.</th>
<th>Industry</th>
<th>Employment Rank</th>
<th>Employment</th>
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<tr>
<td>0</td>
<td>Business Services</td>
<td>26</td>
<td>55,059</td>
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<tr>
<td>12</td>
<td>Heavy Construction Services</td>
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<td>23</td>
<td>Hospitality and Tourism</td>
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<td>29</td>
<td>Education and Knowledge Creation</td>
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<td>25</td>
<td>Transportation and Logistics</td>
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<td>12</td>
<td>Automotive</td>
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<td>23,054</td>
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<tr>
<td>3</td>
<td>Textiles</td>
<td>3</td>
<td>21,108</td>
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<td>30</td>
<td>Financial Services</td>
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<td>Distribution Services</td>
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<td>31</td>
<td>Processed Food</td>
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<td>16</td>
<td>Plastics</td>
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<td>23</td>
<td>Information Technology</td>
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<td>11,924</td>
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<td>13</td>
<td>Production Technology</td>
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<td>11,807</td>
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<tr>
<td>5</td>
<td>Power Generation and Transmission</td>
<td>5</td>
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<tr>
<td>26</td>
<td>Metal Manufacturing</td>
<td>26</td>
<td>11,024</td>
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<tr>
<td>9</td>
<td>Forest Products</td>
<td>9</td>
<td>10,441</td>
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<tr>
<td>11</td>
<td>Motor-Driven Products</td>
<td>11</td>
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<td>31</td>
<td>Entertainment</td>
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<td>19</td>
<td>Chemical Products</td>
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<td>Building Fixtures, Equipment, and Services</td>
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<td>Publishing and Printing</td>
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<td>Construction Materials</td>
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<td>Medical Devices</td>
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<td>Furniture</td>
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<td>Biopharmaceuticals</td>
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<td>3,653</td>
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<td>21</td>
<td>Lighting and Electrical Equipment</td>
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<td>3,318</td>
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<td>Prefabricated Enclosures</td>
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<td>Analytical Instruments</td>
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<td>21</td>
<td>Communications Equipment</td>
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<td>Agricultural Products</td>
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<td>Apparel</td>
<td>15</td>
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<td>20</td>
<td>Aerospace Engines</td>
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<td>1,359</td>
</tr>
<tr>
<td>30</td>
<td>Leather and Related Products</td>
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<tr>
<td>19</td>
<td>Fishing and Fishing Products</td>
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<tr>
<td>43</td>
<td>Oil and Gas Products and Services</td>
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<td>38</td>
<td>Jewelry and Precious Metals</td>
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<td>216</td>
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<td>43</td>
<td>Sporting, Recreational, and Children’s Goods</td>
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<tr>
<td>34</td>
<td>Footwear</td>
<td>34</td>
<td>10</td>
</tr>
<tr>
<td>32</td>
<td>Tobacco</td>
<td>32</td>
<td>10</td>
</tr>
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</table>

Based on the chart of employment by traded cluster in Figure 5, national rankings for cluster industries show South Carolina to be well positioned in today’s economy to grow its assets. With nine industry clusters ranking in the top 15 for the nation—including Textiles—South Carolina has the potential for significant growth.

Figure 6 illustrates South Carolina’s traded cluster specialization and shows the traded clusters that have added or lost jobs from 2000 to 2010.

**Figure 6: South Carolina Economy Traded Cluster Composition, 2000-2010**

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**The Challenge**

The strategy of attracting manufacturing operations by emphasizing a flexible workforce, cheap land, good infrastructure, and responsive government was successful for a while, especially at creating jobs and attracting investments. However, in the era of increased globalization that started in the 1990s, it has been less effective at actually creating value or raising the standard of living in the state. A growing number of low-cost competitors around the world, such as China and Mexico, have rendered this job creation strategy less viable in the 21st century.

Wage growth in South Carolina was slower than in the rest of the United States between 1990 and 2001 (3.7 percent and 3.9 percent, respectively), and average wages in South Carolina still stood at

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approximately 80 percent of those in the United States at the end of that period. The state’s unemployment rate was consistently higher than the national average throughout the late 2000’s recession, reaching to almost 12 percent in 2009. Innovation output also lagged behind the rest of the country in the 2000s, with patents per employee less than half of the national average (a gap that had been increasing) and venture capital funding at less than $3 per worker, compared to a national average of $155 per worker.

South Carolina faces several challenges as it transitions into a new globalized knowledge economy, in which growth has largely been driven by highly innovative technology and knowledge-based companies. While its economic development leaders have sought to attract corporate headquarters and research and manufacturing facilities, the effort has proven difficult. The most critical factor limiting growth is the availability of an educated, sustainable workforce. Industry leaders have struggled to find new strategies to increase their workforce talent pipeline and remain competitive.

Competitiveness Initiative

The challenge of making South Carolina competitive became an issue that concerned many of the state’s business and civic leaders, particularly following the 2001 recession. As concerned citizens, they worried that South Carolina was falling behind relative to its neighbors in per capita income and quality of life measures. As business leaders, they were particularly concerned about the impact that South Carolina’s struggle to compete in the new knowledge-based economy would have on both their own companies and on the broader state economy. In 2003, several of these leaders launched the South Carolina Competitiveness Initiative, which aimed to bring together relevant stakeholders from around the state, assess the competitive position of South Carolina, examine existing industry clusters in the state, and build consensus on a shared economic strategy for South Carolina.


21 The Initiative recruited Harvard Business School Professor Michael E. Porter to advise the effort, and hired the strategy consulting firm Monitor Group to produce an initial report and a set of recommendations on improving South Carolina’s competitiveness. The partners conducted interviews with over 125 leaders in business, academia, and government; administered nearly 450 surveys to business executives; conducted secondary research; and analyzed economic indicators from a variety of sources.
The results of the Competitiveness Initiative suggested a new direction for the state’s economy—one that moved “from a region seeking to create jobs to a region striving to raise prosperity; from offering a low-cost position to building an environment that will foster differentiated high-value creation; from simply recruiting outside companies to building robust clusters; and from government-led initiatives to public-private collaboration.”

The 2005 report, *South Carolina Competitiveness Initiative: A Strategic Plan for South Carolina*, emphasized that South Carolina had a good business climate with low levels of taxation, but was hampered by chronic underfunding in the state’s public education system, a lack of support for research universities, and a low workforce skill level relative to that of the nation. A new commitment to the public education system, including higher and technical education, would enhance the state’s ability to drive human capital improvement and thus raise per capita income and economic competitiveness.

The report provided eight recommendations for improving the South Carolina economy:

1. Create new institutions for economic development.
2. Activate and upgrade clusters.
3. Continue to enhance education and workforce training.
4. Invest in research and the university system.
5. Launch internal and external marketing campaigns.
6. Create an explicit economic development program for distressed areas.
7. Increase support for startups and local firms.
8. Measure progress in raising prosperity.

The first step was to create an organization to take charge of implementing these recommendations and provide private sector “ownership” of the Competitiveness Initiative. The South Carolina Council on Competitiveness, later rebranded as New Carolina, began with a board that included over 100 representatives from large and small businesses, universities, and government. New Carolina’s mission has been to find, build, and celebrate industry clusters in South Carolina and to improve the business environment for better growth.

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24 See Appendix A for a summary of the progress made on each of these eight recommendations.
New Carolina

New Carolina’s history is one of adaptation and accomplishment. The organization was created with a board of directors that represented businesses across the state, and was led by Chairman M. Edward Sellers, then CEO of BlueCross BlueShield of South Carolina. Initially, state support was strong, with active involvement by then Governor Mark Sanford, South Carolina Department of Commerce (SCDoC) Secretary Bob Faith, and presidents of the state’s research universities. As the effects of the recession were felt in the legislature, state funding and the involvement of the governor’s office stopped. However, New Carolina clusters and task forces have continued to engage with state government agencies on a working level with great results. For example, the division of the SCDoC that promotes recycling market development has been instrumental in the functioning of the organized recycling cluster.

New Carolina also has received some federal funding, which has opened the doors for the organization on the national and international cluster development stage. In addition to being a part of the U.S. Economic Development Administration (EDA) grant for the U.S. Cluster Mapping Project, New Carolina was one of 10 recipients of a U.S. Small Business Administration (SBA) grant of $1.2 million over two years for the Carolinas’ Nuclear Cluster (CNC). This grant helped draw more small businesses in the Carolinas to the two-state area’s nuclear cluster, which aims to optimize the competitive advantage of nuclear production. New Carolina also was awarded a $27,000 grant from the EDA for “Regional and Statewide Networks to Promote the Growth of Entrepreneurial Firms in South Carolina” and produced a report with the Darla Moore School of Business at the University of South Carolina (the Moore School of Business) detailing the impact of entrepreneurial firms on the economy of South Carolina.25

New Carolina launched with enthusiasm, but an election cycle and a shift in focus to national and international audiences marked a decline in public outreach about the group’s ongoing activities. The cluster organizations themselves handled most of the public relations and did not strongly emphasize New Carolina’s involvement. For several years, the task of identifying and growing clusters and working with funding changes overshadowed New Carolina’s story. Communicating the accomplishments of this organization has reemerged as a top priority.

Telling the story is one of the fundamental requirements of a successful competitiveness initiative, and there have been many successes to impart. From early cluster initiatives like the CNC to more recent ramp-ups such as the RecyclonomicsSC recycling cluster, New Carolina has been supporting initiatives with federal and foundation grant writing, staff support, and financial management. New Carolina has directly contributed to the launch of the CNC, South Carolina Tourism Alliance, Carolinas’ Engineering

25 Follow-ons to the grant will be discussed in the following “New Carolina Activities” section.
Cluster, Transportation Distribution Logistics (TDL) Council, Insurance Technology and Services South Carolina (iTs|SC), Creative Industries Cluster, Medical Devices cluster, South Carolina Hydrogen and Fuel Cell Alliance, Advanced Security Technology Research Alliance (ASTRA), and RecyclonomicsSC.

The life cycle of a cluster is difficult to predict. One of the tenets of cluster development is that while all cluster initiatives are good, they do not necessarily have advantageous timing or an optimal mix of resources and focus. Most New Carolina cluster initiatives are doing well and primarily run themselves, such as the CNC and the TDL Council. Some initiatives have evolved into new partnerships, such as the Medical Devices cluster, which became part of the life sciences association SCBIO, and ASTRA, which became part of the Charleston Defense Contractors Association (CDCA). However, other initiatives like the South Carolina Tourism Alliance have become dormant. After some short-term successes, such as the “Time to Thaw” national marketing campaign to promote South Carolina tourism, the Tourism cluster initiative became largely focused on legislative lobbying. With the economic downturn, state funds have not been as forthcoming as they were in the past, and the Tourism cluster has been waiting for new leadership to provide new goals and direction.

New Carolina’s push to promote clusters has had some visible impact. Not only is there broader awareness of the existing clusters, but the idea of clusters as a tool has been gaining traction as well. Other economic development groups, including government agencies, also have started organizing their industry recruitment around clusters.

New Carolina Activities

New Carolina has been working to connect the dots across South Carolina to ensure that the state is focusing its efforts on the areas where it can be most competitive on the national and global stage. New Carolina differentiates itself from other trade associations or chambers of commerce by reaching out across industries, academia, and the public sector that all have mutual objectives. The key to a competitiveness agenda is collaboration. Such collaboration occurs on many levels: within a cluster, between organized clusters, and among various entities interested in working on a common goal. New Carolina works on all these levels as part of a comprehensive competitiveness strategy.

Cluster Activation and Development

The first layer of collaboration is formalizing a cluster within an industry. Cluster activation requires industry leaders to come together in support of a common vision for their industry. New Carolina facilitates this visioning process by including the relevant public sector officials. Support from educational institutions can either be included at the beginning or added later as cluster needs are identified. Once a cluster organization has a clear vision—which may necessitate an economic impact
study to fully realize its scope—a strategic plan can be created to identify goals and metrics for success. New Carolina has provided levels of collaboration support to clusters at different stages of progress. Every cluster has its own qualities and needs. New Carolina’s ability to be flexible to such needs has enabled it to maintain contacts and provide support in many ways to a variety of clusters.

One example of an organized cluster that has united the public and private sectors at the highest levels of state leadership is the TDL Council. TDL Council membership is limited to 27 private sector businesses directly involved with transportation, distribution, or logistics, with three seats reserved for leaders of the SCDoC, South Carolina Department of Transportation (SCDoT), and South Carolina Ports Authority. Companies that provide support to the TDL Council are invited to become associate council members.

State government leadership was supportive of New Carolina in its early years, both financially and intellectually. Because the recession decreased the amount of state revenue available for economic development activities that the government believed could be supported by the private sector, state funding was stopped completely in 2007. As a result, high-level engagement diminished. State involvement continued through SCDoC staff members that were active in a number of cluster activities and task forces, including the recycling cluster. It was with the formation of the TDL Council that influential state leaders reengaged with New Carolina.

The TDL Council was established to ensure that South Carolina would be prepared to take advantage of the increase in shipping business that followed the widening of the Panama Canal in 2015. The Port of Charleston has been the economic driver of South Carolina, despite falling in national rankings over the first decade of the 21st century. For the first time, the leaders of the SCDoC, SCDoT, and South Carolina Ports Authority came together with the private sector to envision the future of the industry, and the TDL Council was formed. The council held a statewide summit to develop its strategic plan, which called for the creation of a statewide freight plan that the entities had never before produced. The TDL Council is currently working with the SCDoT on the creation of a statewide multimodal freight plan, which will be championed by TDL Council business leaders in the state legislature during funding priority determination.

An example of a mostly private sector driven cluster is the CNC, which formed in 2007. The Carolinas supplied 9.9 percent of the nation’s nuclear energy in 2011. Currently, North Carolina has five nuclear reactors in operation, 32 percent of the state’s total electricity generation, and two potential new units in the application process. South Carolina has seven operating reactors, 52 percent of the state’s total

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27 See Appendix D for more information on the CNC.
electricity generation, and two of four new nuclear builds in progress. Since its inception, the CNC has commissioned two economic impact studies and a strategic plan. Early on, the CNC developed a list of criteria to determine eligibility for membership and to ensure that the member base would be focused on the future of nuclear energy. Membership now consists of 54 organizations across both states. Through New Carolina, the CNC received one of 10 SBA grants for Regional Innovation Clusters for a total of $1.2 million over two years. The grant was to develop and integrate more small businesses into the nuclear energy supply chain, support continued growth of the cluster, and address gaps to establish a long-term, sustainable, and competitive position.

One of the most innovative initiatives from the CNC was Leadership Energy Carolinas (LEC). This program was developed to cultivate young talent in the nuclear industry. With an aging workforce and increasing demand, the nuclear industry recognized workforce development as an immediate goal. The CNC asks its member organizations to consider their high-potential employees for this one-year professional development forum. There are four LEC class sessions each calendar year that focus on communications, media, research, legislative issues, and industry trends. Class members visit various nuclear operations in the Carolinas and meet industry executives, policymakers, and others critical to the success of the Carolinas’ nuclear cluster. All this has helped make LEC a best practice under consideration by other New Carolina clusters.

South Carolina Competitiveness Network and Summit Planning

In 2013, New Carolina started a pilot project to provide collaboration across organized clusters with the South Carolina Competitiveness Network.29 The first meeting included managers from each identified cluster organization, as well as representatives from the Upstate South Carolina Alliance and the Charleston Regional Development Alliance (CRDA), both of which have focused on regional cluster industries for targeted economic development recruitment. The meeting began with a panel on lessons learned from three of the more established clusters in the state; continued with a discussion of the U.S. Cluster Mapping Project, including a demonstration of its website; and concluded with a challenging discussion on measuring success.30 The Competitiveness Network envisions bringing together cluster organization representatives four to six times a year to discuss themes of competitiveness.

New Carolina also is planning a Competitiveness Summit. Plans include launching a competitiveness index by which South Carolina can measure its progress relative to other states and countries. The summit also would grant awards to specific cluster organizations and leaders and recognize those who have made the biggest impact on the competitiveness of their industries. There is great enthusiasm

29 The South Carolina Competitiveness Network was inspired by the Oregon Cluster Network, which New Carolina was introduced to through the U.S. Cluster Mapping Project.
30 See Appendix E for the “South Carolina Competitiveness Network Pilot Agenda.”
among cluster group participants for the opportunity to come together and develop a plan to further advance South Carolina.

Task Forces

In addition to cluster-specific collaborations, one of New Carolina’s mandates is to improve South Carolina’s business environment for better growth. There are three key factors of the business environment that New Carolina focuses on through its task forces: Education and Workforce Development, Entrepreneurship, and Distressed Areas. These factors are relevant to all clusters and to state residents as they work to move the economy forward. Similar to clusters, each task force has its own sense of timing and an optimal mix of resources and leadership.

The most active and successful of the task forces has been Education and Workforce Development, the only forum in South Carolina where education and workforce development agency heads, policymakers, and business leaders meet on a regular basis to prioritize issues and collaborate on solutions. The initial focus of the task force was to support the development and adoption of the South Carolina Education and Economic Development Act (EEDA). The EEDA, passed in 2005, established a new vision for education based on the idea of “Personal Pathways to Success” for all students. This act integrates academic and career-based education into a unified system that offers more and better ways for all students to succeed.

Following the successful adoption of the EEDA, the task force continued the discussion on workforce development. In 2012, the task force assessed its progress in integrating career paths into the education system, as well as in aligning high school exit requirements with college and career entrance requirements. Research indicated that after significant initial success with increasing the South Carolina high school graduation rate to one percent short of the national average, the graduation rate—like the state’s per capita income numbers—stagnated, signaling the need for some fundamental changes.

At the end of 2012, a steering committee organized under the South Carolina State Board of Education approached New Carolina with recommendations for transforming the public education system. The steering committee had evaluated the problem and recommended solutions, but needed a public-private organization that could implement its ambitious plan. The committee was drawn to New Carolina’s reputation as a collaborative organization with access to leaders in business, the public sector, and education at all levels. New Carolina officially accepted this challenge in December 2012, and the initiative under New Carolina was publicly launched at a summit on May 1, 2013.

The Entrepreneurship Task Force focuses on creating the best environment for startups in South Carolina. Startup firms require much different levels of support than established businesses. The initial

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focus of the Entrepreneurship Task Force was on identifying and cataloging business incubators around the state and publicizing their services to entrepreneurs. This was implemented through a research project and culminated in a conference and the presentation of a resource catalog.

The next step in supporting entrepreneurship was to reach out to high-growth, high-impact firms, which are responsible for the majority of job growth in South Carolina. New Carolina supported this activity with EDA funds matched by private sector funds to conduct two high-impact entrepreneurship conferences and to commission a study. The first conference in 2009 was a conversation about increasing the number of startup firms and existing firms that have the potential to eventually become large companies with headquarters in the state. Following that first conference in 2009, a study was commissioned by New Carolina through the Moore School of Business to identify those high-impact firms in South Carolina. From the second conference held in 2011, recommendations included conducting a capital markets study to identify the barriers to growing smaller firms into larger firms. In 2013, through the FABER Center for Entrepreneurship at Moore School of Business, New Carolina commissioned the Capital Market Study, which contained recommendations for improving capital market opportunities in South Carolina. Currently, New Carolina and its partners are discussing the implementation of those recommendations.

Distressed Areas, the final task force under New Carolina, started in 2005 with an inventory of programs and resources available for economically distressed areas in South Carolina. A group of dedicated individuals initiated a strategic plan in 2008, but a number of factors caused the group to lose momentum after the plan was created. The Palmetto Institute, a task force member, initiated one element of the strategic plan—the Benefits Bank of South Carolina. It created a one-stop shop for those eligible for access to federal and state benefits to maximize the impact of those programs in the areas where they are needed most.

Outcomes and Indicators of Success

The most difficult part of evaluating organized cluster efforts is determining how to measure success. For each industry, success has a different meaning: for the insurance technology and services industry, success is measured by increased awareness of the industry as evidenced by social media and digital

media analytics; for the nuclear industry, success is attracting more leading industry headquarters to the Carolinas; and for the Creative Industries Cluster, success is represented by new ventures that arise from informal connections made at a cluster gathering.

The largest evidence of New Carolina’s success—and that of the organized cluster effort in general—stems from the fact that private companies continue to invest in the organization and believe it is worth their time and resources. Whereas many economic development strategies are government-driven—for example, incentives to attract branch manufacturing—New Carolina’s cluster efforts have largely been private sector led. Therefore, they have focused on what established companies in South Carolina believe is important to boost collective competitiveness.

For example, the CNC has seen dramatic growth over the last five years. Since 2007, the cluster organization has steadily grown from its original 18 members to more than 50 today. Members include globally recognized leaders in nuclear technology, engineering, construction, utility operations, research, education, and small supply and service firms. They view membership as a way to enhance their reputation and credibility. High meeting attendance demonstrates that senior leadership in these organizations view the CNC as a worthwhile use of their time. Further evidence of the CNC’s success comes from the recognition that it has received from many external sources.

New Carolina also can point to many other outcomes over the last 10 years. In addition to the nuclear cluster, the creative cluster that is centered on Charleston also has been successful. Largely driven by individuals who were less concerned with economic development, this cluster has become recognized as a driver of economic revitalization with tremendous impact. Initially, a steering committee was organized to galvanize the members by holding the inaugural “Pecha Kucha Charleston.” Pecha Kucha (Japanese for “chit chat”) is a licensed program that allows presenters only 20 slides, each shown for no more than 20 seconds. Fifteen Pecha Kucha events have been held in Charleston, some selling out to 300 people in less than 20 minutes. The idea has been adopted around the state not only as programs, but also as a format for various conference presentations.

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34 See Appendix D for an in-depth look at the CNC.
There also have been improvements in South Carolina’s chronic human capital challenges. The Education and Workforce Development Task Force has succeeded in increasing the pipeline of high school graduates prepared for higher education and careers and in connecting the adult workforce to education, training, and careers in the knowledge economy. It has launched a number of initiatives that have been highly successful, including the EEDA.

In addition, South Carolina has shown marked improvements in a number of areas:

- The total number of GED diplomas has risen every year, from 4,364 in 2004 to 7,731 in 2010. At the same time, the pass rate of adults taking the GED has risen from under 70 percent to over 75 percent. For the first time in 2010, South Carolina’s pass rate exceeded the national average.35

- The total number of apprenticeships has jumped from under 800 in 2007 to more than 3,000 in 2011, while the number of registered apprenticeship programs has more than tripled from 90 to 290 in the same period.36

**Metrics of Success:**

“Measure what you can, tell stories about the rest.”

All organized cluster leaders realize the importance of measurable success. At the South Carolina Competitiveness Network Pilot meeting, they determined that two types of measures were needed—one to measure an industry and one to measure a cluster. Evidence of industry success included economic impact studies and the number of jobs created and dollars invested, as well as the number of patents applied for and awarded. For the creative industry, revenue per employee was a good indicator of economic impact. Cluster leaders noted that economic impact numbers showed the local impact of job growth and industry strength, but measuring cluster competitiveness required thinking in terms of a national or even global perspective.

The U.S. Cluster Mapping website is one source for cluster competitiveness data that could help lead to a comprehensive statewide competitiveness index for South Carolina. Before New Carolina can recommend a statewide competitiveness index, strong consideration must be given to determine the correct indicators. The challenge is in choosing measures that the clusters can have a direct impact on. There is also real danger in measuring the state against indicators that will not be greatly affected year to year, as this may be construed as a lack of progress. While increasing competitiveness and raising

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prosperity are long-term propositions, incremental progress must occur to maintain momentum and morale.

Consideration must also be given to which other organizations can be used as appropriate comparables. For example, the CRDA created an annual Scorecard of Competitiveness for the Charleston metropolitan statistical area (MSA). In order to choose the indicators by which Charleston would be measured, the CRDA first chose which MSAs it wanted to be measured against. A significant amount of online data was available that could be used to develop the indicators. The CRDA chose to follow the Model for Economic Prosperity pyramid\(^{37}\) to assess the hard data of the MSA’s economic development outcomes—economic output, employment, earnings, and income—and the soft data of competitiveness inputs—human capital, innovative activity, entrepreneurial environment, and quality of place. By targeting the clusters where the Charleston MSA had a competitive advantage, the CRDA created a comprehensive picture of its current situation with recommendations to improve in the future.

Lessons Learned

After eight years of activity, New Carolina, its cluster organizations, and its partners have many lessons learned to share. At the recent Competitiveness Network meeting, the following lessons were identified:

1. **Key industry leadership must be engaged.** Quality involvement at both the CEO and mid-level is vital to maintaining the momentum of an organized cluster. Growth in membership was not a goal in every cluster group, but all agreed that a basic requirement was quality membership. The CNC has strict membership eligibility requirements, the TDL Council has limited seats, and the Creative Industries Cluster does not have a formal membership model.

2. **State government officials need to be identified and engaged.** Access to working-level officials with decision-making authority and the highest-level state officials is beneficial to business sector leaders as they work to make significant changes in their industries. State and local government should be included in cluster activities to make them a part of the solution. This will also help the governments leverage their resources for the greatest visible impact.

3. **Clusters need a focusing goal to serve as a rallying point.** Cluster activation success is higher when there is a focus for action and when long- and short-term objectives are balanced. The lack of longer-term objectives was one reason that the Tourism cluster initiative stalled, whereas the focus on such objectives has been a source of strength for the CNC. Once a cluster comes together, new goals need to be developed to move the group forward.

4. **Dedicated staffing is essential to sustain progress.** The level of structure needed requires adequate funding and private sector commitment. It is important to start with the end goal in mind so that initial funding commitments can take into account the costs associated with the goals and activities envisioned by the organized cluster. New Carolina’s most effective cluster efforts have paid positions rather than relying on volunteer staffing.

5. **Not every cluster will follow the same course.** Each cluster will have its own identity just as each industry does. There are a number of structural models to choose from for cluster development, but the implementation of those models will be unique to each industry.

6. **Clusters find value in collaboration across industries.** This develops a healthy business environment in which related industries are able to collaborate and grow. Likeminded cluster developers see the value in “cross-pollinating” clusters like recycling and the TDL Council, where natural synergy exists.

7. **Traditional industry recruitment agencies can benefit from existing clusters.** Recruitment agencies should be included in cluster development discussions so that they are informed about existing clusters, can target those industries, and can sell an existing vibrant industry cluster organization as an available resource.

8. **Task forces that focus on the cross-cutting factors of competitiveness are essential to the overall business environment.** Task forces are well suited to supporting long-term fundamental strategies that promote growth for all industries, but they need input across business sectors to succeed. For example, workforce development is critical to the success of many industries in South Carolina. The Education and Workforce Development Task Force of New Carolina brings the power of business to bear on the education system in order to achieve significant results that benefit all.

9. **Telling the story is vitally important for both cluster organization growth and motivation for the state.** It is important to keep supporters informed about different activities in different clusters. That way, when the time comes to reach out to policymakers, the information can come from the private sector and not just the organizing entity.

10. **Competitiveness is global; economic impact is local.** The economic impact numbers are important to make the case for industry influence, but competitiveness is about raising expectations as a state.
Conclusion

South Carolina has made significant progress in the last 10 years—eight of those with the help of New Carolina. Business leaders created the organization out of concern that a focus on outside business recruitment was not sufficient for growth and prosperity in a global economy. Now when businesses are considering a move to South Carolina, recruitment agencies can use cluster development as a tool to identify existing networks of companies involved in industry and business environment growth. New Carolina leads the engagement through collaboration within industries, among cluster groups, and across the state on critical areas of focus. The result is a vibrant economy with forward-looking business leaders who collaborate with policymakers on actions to take that increase prosperity in South Carolina. Policymakers and practitioners can apply the lessons learned by New Carolina to their regions. However, each location needs to devise the right competitiveness strategy to leverage its unique mix of industry clusters and business environment conditions and, in turn, increase business growth, productivity, and new business formation.
Appendix A: Progress Report on Competitiveness Recommendations

Although state leaders have never formally adopted cluster development as a comprehensive economic development strategy, great progress has been made on all the recommendations from the Strategic Plan for South Carolina. Here is a summary of progress since 2003:

1. **Create new institutions for economic development.** New Carolina was created as a direct result of the Strategic Plan and recommendations.

2. **Activate and upgrade clusters.** Today, there are two bi-state cluster initiatives with North Carolina (nuclear and engineering), 10 statewide cluster initiatives, and two regional cluster initiatives.

3. **Continue to enhance education and workforce development.** New Carolina formed an Education and Workforce Development Task Force. Co-chaired by two prominent CEOs, this is the only organization in the state that holds regular meetings on all public education interests. To help South Carolina move into the knowledge economy, the task force adopted five strategies:
   - Prepare children for success in school through increased parental involvement in schools and enhanced training for 0–K daycare providers.
   - Increase the pipeline from high school through the Education and Economic Development Act (EEDA), which has been renamed “Personal Pathways to Success.” This program established 16 occupational clusters and provided virtual job shadows and various opportunities for students to learn about different careers. Since its inception, high school graduation rates in South Carolina have improved to less than two points below the national average.\(^{38}\)
   - Align higher education with economic development strategies.

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• Connect adults to education and training through the WorkKeys jobs skills assessment created by ACT, apprenticeships, and the readySC workforce training program.

• Develop a culture for valuing education.

4. **Invest in research and the university system.** South Carolina created the Centers for Economic Excellence, now called SmartState. Today, there are 49 centers, with 35 endowed chairs for each and endowments of $2 million to $5 million per chair. The state’s investment has brought in $1.2 billion in outside funds and has created 7,000 jobs. One example is the Clemson University International Center for Auto Research (CU-ICAR), which has four endowed chairs and $450 million in public and private funds. The school produced the nation’s first doctoral program in automotive engineering. Additionally, the state passed the Innovation Centers Act and the Research Infrastructure Bond Act in 2004, which provided funds for three new research centers associated with Clemson, the University of South Carolina, and the Medical University of South Carolina, as well as $220 million in general research funding. Finally, the state has reached out to establish business and research relationships with Israel, one of the most innovative countries in the world. Two trade missions have resulted in more than 100 new business and research relationships between Israel and South Carolina.

5. **Launch internal and external marketing plans.** New Carolina has helped launch several campaigns, including a tourism marketing plan (“Time to Thaw”), a certified South Carolina agricultural products campaign (“Nothing Fresher, Nothing Finer”), a recycling marketing campaign, and branding for the New Carolina organization itself at newcarolina.org.

6. **Create an explicit economic development program for distressed areas.** New Carolina contracted to complete the plan with MDC (originally known as Manpower Development Corp.) in Raleigh, NC. The report is called *An Action Agenda to Spur Economic Success* and is located in the publications section of the New Carolina website. Its major recommendation was to form something similar to the North Carolina Rural Center, and New Carolina has been trying to find strategic partners and grant money for implementation. The report also has been passed on to the implementers of a major initiative funded by federal grants for the I-95 corridor.

7. **Increase support for startups and local firms.** New Carolina sponsors an annual competition with the Charleston Chamber of Commerce called “New Ideas for New Carolina.” Nearly 1,000 business plans have been submitted over the last five years as a part of this competition. In addition, New Carolina, through the Entrepreneurship Task Force, has formed a Startups Committee that has held several conferences over the past four years, including:

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40 “About Us,” readySC™. See [http://www.readysc.org/about.htm](http://www.readysc.org/about.htm).
• A conversation on minority entrepreneurship with John Sibley Butler of the IC² Institute at The University of Texas at Austin.

• A conversation on incubators with Diane Atkins of the National Business Incubation Association (NBIA).

• A conversation on high-impact entrepreneurship with Eric Pages.

• A rollout conference funded by the EDA highlighting high-impact entrepreneurs in South Carolina. As a result of this conference, a State Innovation Plan and a Capital Markets Plan have been developed, and a page on the South Carolina Department of Commerce website details resources available to startup companies.

8. **Measure progress in raising prosperity.** This is an ongoing challenge, but New Carolina hopes to launch a statewide competitiveness index to be consistently used for measurement. Most of the progress made in South Carolina and New Carolina is best explained through examples of success.
Appendix B: South Carolina Cluster Summaries

The principal focus of New Carolina has been cluster initiatives. Its original work with the Competitiveness Initiative identified five clusters. In practice, this has grown to 15: two bi-state clusters, nine statewide clusters, and four regional initiatives.

1. **Advanced Materials (Composites).** An industry assessment was done in 2006, noting 140 companies largely centered in the Upstate region of South Carolina. New Carolina held the initial conference around this industry in 2007 and worked with industry leaders to develop an organized cluster in 2008. Lacking a driving agenda, the organized cluster failed to take root and now lies dormant.

2. **Advanced Security.** New Carolina worked with a large number of U.S. Department of Defense contractors in the Charleston region and many small cyber security firms to form a cluster initiative called ASTRA. This organization focuses on workforce development with the state technical college system and regional universities, and it is building a testing space for entrepreneurs to use when developing new technologies.

3. **Agribusiness.** Known as the Palmetto Agribusiness Council, this cluster is a $34 billion industry with a goal of growing agribusiness to a $50 billion industry by 2020. The Palmetto Agribusiness Council secured funding through the South Carolina Department of Agriculture for an economic developer at the South Carolina Department of Commerce (SCDoC) to recruit agricultural processing companies and to export agricultural products.

4. **Automotive.** The Automotive Council was formed under the South Carolina Manufacturers Alliance to reach out to auto manufacturers across the state. New Carolina holds a seat on that council and provides cluster development guidance.

5. **Aviation and Aerospace.** This cluster was originally centered in upstate South Carolina. There were 103 aviation companies when the cluster was mapped in 2006, but the efforts remained regional and largely unorganized. However, the location of Boeing’s new facility in Charleston has reinvigorated the cluster. A Center of Excellence was created at University of South Carolina, and the SCDoC has formed an Aerospace Task Force to develop a strategic plan for aerospace in South Carolina. New Carolina is working closely with the task force chair to provide assistance.

6. **Creative.** In 2008, New Carolina and the Charleston Regional Development Alliance (CRDA)
convened a group of creative professionals to promote a cluster initiative. This occupational cluster accounts for 27,315 reported creative jobs in the region, or 7 percent of the region’s total workforce. Creative professionals generated $1.4 billion per year in gross sales in 2010, with average salaries above the regional average. The committee’s action plan was to promote new enterprise development among creative firms and entrepreneurs, and convene working groups of key organizational stakeholders.

7. **Engineering.** The engineering cluster initiative has drawn attention to the more than 300 engineering companies in South Carolina. It also has launched initiatives to train teachers and encourage students to consider a career in engineering. New Carolina administers a South Carolina Department of Education grant for “Project Lead the Way,” which works with schools and districts to support the implementation of effective science, technology, engineering, and mathematics (STEM) education programs.

8. **Hydrogen and Fuel Cells.** In 2005, ICF Consulting conducted a thorough, statewide analysis of South Carolina’s next energy opportunities with hydrogen and fuel cells. The study showed that the hydrogen and fuel cell industry represented a significant knowledge-based market opportunity for the state. Leaders from business, higher education, research, and community sectors across South Carolina came together to develop a 20-year strategy and to focus the strengths of the state’s competitive advantage in the industry. The goal of the strategy is for South Carolina to become a leader in the emerging hydrogen and fuel cell economy.

9. **Insurance Technology.** In 2006, New Carolina and the Greater Columbia Chamber of Commerce were approached by a group of insurance technology companies to address how the industry could raise awareness, strengthen its competitive position, and address workforce and talent development. Over the next two years, New Carolina worked with these companies to develop and build an economic development strategy for insurance technology and services. In 2008, the cluster organization officially launched under the Insurance Technology and Services South Carolina (iTs|SC) brand. Today, iTs|SC is a talent-rich economic development cluster activity of businesses, educational institutions, and industry professionals dedicated to expanding the Midlands\(^{42}\) of South Carolina as a global destination for insurance and insurance technology services.

10. **Life Sciences.** SCBIO is a member organization that exists to support and advance South Carolina’s life sciences industry through collaboration, advocacy, workforce development, and support for business operations. New Carolina sits on the board of SCBIO, and was involved in the development of the Medical Devices cluster that became a subcommittee of SCBIO.

\(^{42}\) The Midlands encompasses Calhoun, Fairfield, Kershaw, Lexington, Orangeburg, Richland, Saluda, and Sumter counties. See Appendix F for a county-level map of South Carolina regions.
11. **Nuclear.** New Carolina started the Carolinas' Nuclear Cluster (the CNC) in September 2007 as a collaboration across companies, universities, technical colleges, and nonprofits to advance the nuclear industry in North Carolina and South Carolina. The Carolinas generate 11.5 percent of the nation’s nuclear energy, and South Carolina’s seven nuclear reactors supply 52 percent of its electricity generation needs, with two more reactors currently being constructed.

12. **Recycling.** New Carolina worked with the governor-appointed 14-member Recycling Market Development Advisory Council (RMDAC) to create the recycling cluster known as RecyclonomicsSC. It brings together businesses and industries that utilize recycled materials in their manufacturing processes. RecyclonomicsSC helps to promote recycling markets and to position recycling businesses as competitive participants in developing jobs, retaining local community employers, generating additional tax revenues, and increasing economic development opportunities.

13. **Textiles.** The textile industry still has a major presence in South Carolina as arguably the most innovative industry in the state. Milliken has produced 2,200 patents from its Spartanburg research lab, more than any private company in the United States. A 2007 study commissioned by New Carolina indicated that the state’s Textiles cluster consists of over 900 establishments that employ nearly 65,000 people, with an establishment in each of South Carolina’s 46 counties. These companies brought in over $21 billion in annual revenue in 2007. New Carolina provided funding for the development of SC Textile Connect, which “connects” textile-related information on global events; products; markets; and government, industry, and academic sources within the South Carolina textile complex. New Carolina also held a conference in 2008 to present its research and to continue the discussion on the future of the industry.

14. **Tourism.** In November 2005, New Carolina’s Tourism Cluster Committee commissioned a study by international consultant Michael MacNulty of Tourism Development International (TDI) to complete a Tourism Action Plan. It included a destination-specific marketing plan, in which South Carolina would match local funds on a $1 to $2 basis. This funding model has since been adopted by 30 states. New Carolina’s Tourism Cluster Committee then became the South Carolina Tourism Alliance, which launched a marketing campaign called “Company’s Coming.” However, due to the recent economic downturn, the Alliance initiative became inactive.

15. **TDL Council.** Together the South Carolina Department of Transportation, SCDoC, South Carolina Ports Authority, New Carolina, and private sector industry leaders launched the TDL Council. The TDL Council brings public and private sector leaders together to eliminate major industry obstacles and roadblocks to competitiveness. The focus is on infrastructure, incentives, workforces, and directing focused investments into South Carolina’s economy.
## Figure 8: Summary of South Carolina Clusters

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<td>Federal, State</td>
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Appendix C: Smart Clusters

The SmartState Program™ conducts research in areas of critical importance to South Carolina and the world. There are six industry-focused Smart Clusters that are home to Centers of Economic Excellence and their SmartState Endowed Chairs. Each Smart Cluster offers opportunities for businesses, students, potential faculty, and the public to engage in its efforts.

1. **Advanced Materials and Nanotechnology**
   - Environmental Nanoscience and Risk: [http://smartstatesc.org/nanoenvironmental-research](http://smartstatesc.org/nanoenvironmental-research)
   - Polymer Nanocomposites: [http://smartstatesc.org/polymer-nanocomposites](http://smartstatesc.org/polymer-nanocomposites)

2. **Automotive and Transportation**
   - Supply Chain Optimization and Logistics: [http://smartstatesc.org/supply-chain-optimization](http://smartstatesc.org/supply-chain-optimization)

3. **Biomedical**
   - Advanced Tissue Biofabrication: [http://smartstatesc.org/advanced-tissue-biofabrication](http://smartstatesc.org/advanced-tissue-biofabrication)
   - Brain Imaging: [http://smartstatesc.org/brain-imaging](http://smartstatesc.org/brain-imaging)
   - Childhood Neurotherapeutics: [http://smartstatesc.org/childhood-neurotherapeutics](http://smartstatesc.org/childhood-neurotherapeutics)
   - Clinical Effectiveness and Patient Safety:

- Health Care Quality: http://smartstatesc.org/health-care-quality
- Health Facilities Design and Testing: http://smartstatesc.org/health-facilities-design-and-testing
- Molecular Proteomics in Cardiovascular Disease and Prevention: http://smartstatesc.org/molecular-proteomics
- Neuroscience: http://smartstatesc.org/neuroscience
- Proteomics: http://smartstatesc.org/proteomics
- Regenerative Medicine: http://smartstatesc.org/regenerative-medicine
- Rehabilitation and Reconstruction Sciences: http://smartstatesc.org/rehabilitation-and-reconstruction-sciences
- Renal Disease Biomarkers: http://smartstatesc.org/renal-disease-biomarkers
- SeniorSMART™: http://smartstatesc.org/seniorsmart
- Stroke: http://smartstatesc.org/stroke
- Technology Center to Advance Healthful Lifestyles: http://smartstatesc.org/advance-healthful-lifestyles
- Tobacco-Related Malignancies: http://smartstatesc.org/tobacco-related-malignancies
- Vision Science: http://smartstatesc.org/vision-science

4. Future Fuels®

- Catalysis for Renewable Fuels: http://smartstatesc.org/catalysis-for-renewable-fuels
- General Atomics for the Development of Transformational Nuclear Technologies: http://smartstatesc.org/general-atomics-center
- Solid Oxide Fuel Cells: http://smartstatesc.org/solid-oxide-fuel-cells
- Strategic Approaches to the Generation of Electricity:
http://smartstatesc.org/strategic-approaches

5. Information Science
   - CyberInstitute: http://smartstatesc.org/cyberinstitute
   - Data Analysis, Simulation, Imaging, and Visualization: http://smartstatesc.org/data-analysis
   - Optoelectronics: http://smartstatesc.org/optoelectronics
   - Sustainable Development: http://smartstatesc.org/sustainable-development

6. Pharmaceutical
   - Gastrointestinal Cancer Diagnostics: http://smartstatesc.org/gastrointestinal-cancer-diagnostics
   - Translational Cancer Therapeutics: http://smartstatesc.org/translational-cancer-therapeutics
Appendix D: In Depth—The Carolinas’ Nuclear Cluster

By Scott Carlberg, Carolinas’ Nuclear Cluster Manager

Background: Importance of the Nuclear Industry in South Carolina

Across North Carolina and South Carolina, the nuclear generation industry has more than 37,000 employees, more than $2 billion in annual payroll, more than $4.5 billion in earned income, and more than $750 million paid in state and local taxes. There are currently four nuclear plants under construction within three hours of Columbia, South Carolina, with a combined capital investment in excess of $20 billion. Constructing these plants alone will employ, at the industry’s peak, about 38,000 people in South Carolina. In addition, 15,000 of those are currently employed by the nuclear industry. Recent estimates are that nationally, 39 percent of nuclear employees will be eligible for retirement by 2018. The potential for employee turnover in South Carolina’s nuclear industry is significant.

To address this cluster, New Carolina established the Carolinas’ Nuclear Cluster (CNC), a two-state force. It is a collaboration of more than 50 companies, universities, technical colleges, and nonprofits that advances economic development in the Carolinas by strengthening the region’s nuclear energy industry. The CNC builds on the area’s strengths and economic and intellectual resources to spur economic development and innovation, and to attract likeminded industries by offering collaboration and proximity to key suppliers and customers. It works effectively to build on this competitive advantage in an industry poised for a growing global presence.

How the Nuclear Cluster Began

In 2007, New Carolina approached Duke Energy Corporation with the concept of a nuclear cluster. The initial group of invitees was carefully selected through analyses of industry lists and supply chain maps. There was no general call to attend a meeting—rather, the organizers of the cluster conducted targeted interviews to get the best possible people together in a room. This tradition of actively managing membership, tasks, and messaging has been a constant in the CNC, keeping the discussion at a professional industry level. The members involved in the CNC know the industry and are long-term players for the success of the Carolinas’ nuclear industry.

Leadership of the cluster comes from its own ranks, as a CNC member chairs the entire cluster for a two-year term starting September 1 of each odd-numbered year. Duke Energy provided the inaugural chair, Westinghouse provided the second chair, and URS Corporation provided the current chair, who
will be serving in this role until September 2013. AREVA will take the chairmanship next.

At the first meeting in 2007, the participants decided that the cluster initiative needed an informed direction. The CNC spent six months developing a strategic plan using neutral, external resources, commencing at the end of 2007. The plan combined industry research, economic development findings, and input from influential leaders in the industry, and it defined the cluster’s structure and most critical activities. The planning process included interviews with stakeholders to gather information and to begin the bridge-building necessary to form a cohesive team. The CNC plan created five task forces to oversee a strategic area and define short-term objectives. Every cluster member belongs to a task force, each of which is chaired by a CNC member:

1. **Economic Development**: Defines supply chains and business development to expand the nuclear industry, demonstrating the CNC’s capability to drive a regional network of companies that has a global reach.

2. **Workforce Development**: Works on the challenge of improving professional and craft education in the nuclear energy talent pipeline. It is necessary to provide for new workers and also replace a substantial portion of the existing workforce in the next few years as individuals retire.

3. **Technology Development**: Helps unify the region’s research and development resources for the industry.

4. **Public Policy**: Analyzes policy issues that must be addressed to move the industry forward. This task force largely comprises senior management from nuclear energy organizations.

5. **Communications**: Provides support in shaping the cluster’s basic communications and outreach, including media relations, messages, presentations, and other cluster activities. The outreach also targets the nuclear industry and CNC members.

The entire strategic plan was revised in 2011 as a “10-1-3 Plan”: a visionary 10-year goal, with granular one-year goals and action items as well as three-year stretch objectives.

Aside from the professional and commercial gain, CNC members invest in their region’s nuclear cluster primarily because they believe in the technology, their community, and the next generation of nuclear energy.
### Figure 9: Membership in the Carolinas’ Nuclear Cluster

<table>
<thead>
<tr>
<th>Utilities</th>
<th>Manufacturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duke Energy</td>
<td>ASCO Valve</td>
</tr>
<tr>
<td>SCANA</td>
<td>Pegasus Nuclear</td>
</tr>
<tr>
<td>Carotek</td>
<td>Tetra Tech</td>
</tr>
<tr>
<td>Global Quality Assurance</td>
<td>Westinghouse</td>
</tr>
<tr>
<td>Hendrick Construction</td>
<td>AREVA</td>
</tr>
<tr>
<td>J-E-T-S Quality Consultants</td>
<td>Fluor</td>
</tr>
<tr>
<td>Qualitech Solutions</td>
<td>Generation mPower</td>
</tr>
<tr>
<td>RCS Corporation</td>
<td>The Shaw Group</td>
</tr>
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<td></td>
<td>Toshiba America Nuclear Energy</td>
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<tr>
<td></td>
<td>URS Corporation</td>
</tr>
<tr>
<td></td>
<td>Zachry Nuclear Engineering</td>
</tr>
<tr>
<td>Education</td>
<td>Government, Nonprofits, and Other</td>
</tr>
<tr>
<td>Aiken Technical College</td>
<td>Electric Power Research Institute (EPRI)</td>
</tr>
<tr>
<td>Central Piedmont Community College</td>
<td>EngenuitySC</td>
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<tr>
<td>Clemson University</td>
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</tr>
<tr>
<td>Francis Marion University</td>
<td>Savannah River National Lab</td>
</tr>
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<td>Gaston College</td>
<td>South Carolina State University</td>
</tr>
<tr>
<td>Midlands Technical College</td>
<td>Savannah River Site (SRS)</td>
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<tr>
<td>North Carolina State University</td>
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<td>South Carolina State University</td>
<td>South Carolina Department of Commerce</td>
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<tr>
<td>South Carolina Technical College System</td>
<td>South Carolina Research Association (SCRA)</td>
</tr>
<tr>
<td>Spartanburg Community College</td>
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<td>University of North Carolina at Charlotte</td>
<td>SUNRISE 44</td>
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<tr>
<td>University of South Carolina</td>
<td></td>
</tr>
<tr>
<td>York Technical College</td>
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</tbody>
</table>

### Impact and Indicators of Success

The evidence of New Carolina’s success comes from the fact that private companies continue to invest in the organization because they believe it is worth their time and resources. Whereas many economic development strategies are government-driven—for example, incentives to attract branch manufacturing—the cluster efforts of New Carolina have largely been led by the private sector. Therefore, they are focused on what established companies in South Carolina believe is important to boost their collective competitiveness.

43 SCUREF stands for the South Carolina Universities Research and Education Foundation.
44 SUNRISE stands for the Southeast Universities Nuclear Reactors Institute for Science and Education.
For example, the CNC has seen dramatic growth over the last five years. Since 2007, the cluster has steadily grown from its original 18 organizational members to more than 50 today. Members include globally recognized leaders in nuclear technology, engineering, construction, utility operations, research, education, and small supply and service firms. They see membership in the CNC as a way to enhance their reputation, and high meeting attendance demonstrates that senior leadership in these organizations view the CNC as a worthwhile place to spend time.

This growth occurs amid strict criteria for membership, as there is no automatic membership. Maintaining a “high common denominator” in membership quality means that meetings dig deeply and meaningfully into critical issues with decision-makers at the table. To be considered for CNC membership, commercial organizations must have relevance to the industry in five of seven criteria:

**Figure 10: Criteria for Membership in the Carolinas’ Nuclear Cluster**

<table>
<thead>
<tr>
<th>Trait</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Revenues</td>
<td>$1 million or above for the past calendar or fiscal year in the Carolinas’ nuclear firms</td>
</tr>
<tr>
<td>Full-time Employees</td>
<td>12 or more employees for more than 1 year in the Carolinas’ nuclear firms</td>
</tr>
<tr>
<td>Percent of Sales</td>
<td>25 percent or more for the past year to the Carolinas’ nuclear firms or to engineering firms for the Carolinas’ nuclear firms</td>
</tr>
<tr>
<td>Contracts</td>
<td>2 or more current contracts with a Carolinas’ nuclear firm or engineering firm that designs or maintains a facility</td>
</tr>
<tr>
<td>Longevity</td>
<td>5 or more years in business</td>
</tr>
<tr>
<td>Location</td>
<td>Corporate headquarters in the Carolinas or major branch headquarters representing a significant Carolinas’ capital investment for the firm</td>
</tr>
</tbody>
</table>

Educational institutions that apply for membership must have current curricula that are relevant to the needs of the Carolinas' nuclear generation or engineering community.

The financial stability of the CNC is further evidence of its success. Members of the cluster initiative support its operation on a zero-based balance sheet. Membership fees are set on a sliding scale based on the revenues of the companies. Nonprofits have a special low rate to ensure that they have entry as well as “skin in the game.” Budgets are set for the year for basic operations, and special events and programs must be financially self-sustaining. The financial sustainability of the cluster organization is evidence that the industry sees it as a good investment.

Additionally, credible third parties outside of the cluster have recognized the cluster organization:
The U.S. Small Business Administration awarded one of its 10 “Innovative Economies” contracts of $1.2 million over two years to New Carolina for the CNC in August 2010. There were 137 applications for these contracts nationwide, which are provided to build the small business supply chain in strategic industries. The CNC was the only Southeast award and the only award in an energy generation source. (The next closest energy award was for a Smart Grid in Illinois.) This has been seen as a million-dollar vote of confidence in the CNC.

Economic developers have called upon the CNC to be part of senior management meetings when relocation candidates have looked at the Carolinas. The CNC is meeting with the secretaries from the South Carolina Department of Commerce and North Carolina Department of Commerce to review the new CNC strategic plan and to discuss partnership activities for business recruiting.

International recognition has increased. The CNC manager has helped arrange meetings with energy contingents from France and the United Kingdom. The CNC was asked to share best practices with a business and economic development group from the United Arab Emirates, a nation that intends to build out its industry. Nuclear energy conferences regularly take place in the Carolinas. The London-based Nuclear Energy Insider has held more than a dozen meetings in Charlotte and Columbia after moving from its initial Washington location in 2009. More than 2,000 participants are estimated to have attended these sessions in the Carolinas. The CNC helps place panelists and chooses CNC members as emcees for the events. News organizations and trade groups routinely contact the CNC for information or sources of information.

News stories featuring the CNC have appeared in many local press outlets in the Carolinas, as well as in USA Today and Site Selection.

The goal of the CNC is to double the nuclear workforce in the Carolinas in 20 years. Success will be measured in new full-time equivalents (FTEs) and dollar investments in the states by nuclear energy-oriented firms. A baseline economic impact study was conducted in 2009. It measured the total impact from employment associated with the generation of electricity at seven nuclear stations in North Carolina and South Carolina, and employment at Savannah River and Barnwell sites. Researchers at Clemson University used purchases and payroll data from these businesses in their evaluation. The follow-up study, which is due to be completed in 2013, also will look at:

- Payroll and workforce growth.
- Increased candidates for the workforce from the Carolinas’s universities. The cluster includes major universities with nuclear or energy engineering programs, as well as technical colleges with nuclear craft programs. Filling and graduating the pipeline will take several years.
- New technologies transferred from universities to Carolinas-based nuclear or nuclear-related organizations. A well-established technology network started in 2011.

- New nuclear or nuclear-related businesses or organizations relocating to the Carolinas. This will be measured in several ways, including: the number of economic development organizations with a nuclear-related strategy for recruitment or expansion; and the number of firms that are (1) relocating, (2) making major additions of employees, or (3) expanding a product or service line into the nuclear or nuclear-related field.

Although these measures will take time to be proven quantitatively, the early consensus is that they will be positive. “Our Nuclear cluster is both an important source of energy to residents and businesses, as well as a major player in Carolinas’ job and income creation,” said Mark Henry, study researcher and co-coordinator of the Regional Economic Development Research Laboratory at Clemson University. He added, “This study does not count the out-of-Carolinas nuclear energy work by large engineering firms in the cluster, so the study estimates of the economic impacts are quite conservative.”

The nuclear energy industry provides a positive economic impact through its payroll and supply chain purchases. “These business relationships span the world. Our engineers and energy experts routinely do projects in other nations, bringing back dollars to the Carolinas,” said Mark Fecteau, president and CEO of Westinghouse-Japan, which is formerly based in Columbia, South Carolina as a corporate lead in innovation. Fecteau is also the immediate past chair of the cluster, as the CNC transitioned to URS Corporation on September 1, 2011.
Appendix E: South Carolina Competitiveness Network Pilot Agenda

February 27, 2013, 10:00am-2:30pm
MASC Board Room, 1st Floor, 1411 Gervais Street, Columbia, SC

<table>
<thead>
<tr>
<th>Time</th>
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<tr>
<td>10:00</td>
<td>Introduction and Welcome from Neil McLean</td>
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| 10:15 | Peer Learning Panel: “Q&A with Managers from Three of South Carolina’s Most Successful Cluster Initiatives”  
  - Neil McLean, Facilitator  
  - Tiffany Davis, TDL Council  
  - Scott Carlberg, CNC  
  - Jack Schuler, SC Agribusiness Council |
| 11:30 | Break                                                                               |
| 11:45 | “U.S. Cluster Mapping Project: Presentation of Lessons Learned in Other Regions”  
  - George Fletcher                                      |
| 12:15 | Lunch Presentation: “U.S. Cluster Mapping Website: Cluster Tool Kit”  
  - Neil McLean                                           |
| 1:00  | Group Discussion: “How Do You Measure Success in Your Cluster?”  
  - Laura McKinney                                         |
| 1:45  | Action Items, Lessons Learned, and Next Steps  
  - All Presenters                                         |
| 2:30  | Meeting Adjourned                                                                   |

**Invitees**

Note: This list is composed primarily of cluster practitioners who have been actively engaged with New Carolina. The list is not intended to be exclusive. Please let us know if you have ideas for others who should be involved, and we will add them to our list for future meetings.

**Cluster Leaders**

- Lee Stogner – Engineering
- Scott Carlberg – Carolinas Nuclear Cluster
- Robert Prioleau, Gary Collins, and Lee Deas – Creative
- Meghan Hughes – NuHub
- Shannon-Baxter Clemmons – South Carolina Hydrogen and Fuel Cell Alliance
- Tiffany Davis – TDL\(^45\) Council and Insurance Technology and Services South Carolina (iTs|SC)
- Steve Warner – Charleston Regional Development Alliance (CRDA)
- Jack Shuler – Palmetto Agribusiness Council
- Wayne Roper – SCBIO
- Charlie Farrell – Aerospace
- Erin Ford – Upstate South Carolina Alliance – Energy
- Aimee Redick – Upstate South Carolina Alliance – Auto
- Elizabeth Feather – Upstate South Carolina Alliance
- Jack Moore – Advanced Security
- Lewis Gossett – South Carolina Automotive Council
- Lonnie Emard – IT-oLogy
- George Fletcher – RecyclonomicsSC

**New Carolina**

- Laura McKinney
- Neil McLean
- Moryah Jackson
- Jennifer Haigler

**Other Representatives (not invited to this initial meeting)**

- South Carolina Economic Developers’ Association (SCEDA)
- South Carolina Department of Commerce
- South Carolina Manufacturing Extension Partnership (SCMEP)
- readySC

\(^{45}\) The “TDL” in TDL Council stands for Transportation Distribution Logistics.
Workshop Session Details

Peer Learning Panel: “Q&A with Managers from Three of South Carolina’s Most Successful Cluster Initiatives”

Background and Overview
- How did your cluster get started?
- What types of companies are involved?
- What is your top focus area?

Membership Structure
- How do you recruit new cluster members?
- What is the cost to join?
- Do you have different types of members?

Meeting Structure
- Talk about a typical meeting.
- How is it run? By whom?
- Do you use committees?
- Do you have committee meetings separate from your regular meetings?
- What is considered your greatest success?

“U.S. Cluster Mapping Project: Presentation of Lessons Learned in Other Regions”
- Who are the project participants?
- What are the goals of the project?
- What have we learned about the successes and failures of clusters in other regions in the United States?

“U.S. Cluster Mapping Website: Cluster Tool Kit”
- Overview of the site
- How does New Carolina use the site?
- Data features
• What's next?

Group Discussion: “How Do You Measure Success in Your Cluster?”

• How do you know if you have had a successful year?
• What metrics do you track, if any? Membership? Revenue? Project activity?
• What kind of data do you need from New Carolina?
Appendix F: County Map of South Carolina

General definitions for regional areas of South Carolina included in this report:

- **Upstate:** Abbeville, Anderson, Cherokee, Greenville, Greenwood, Laurens, Oconee, Pickens, Spartanburg, and Union

- **Midlands:** Calhoun, Fairfield, Kershaw, Lexington, Orangeburg, Richland, Saluda, and Sumter

- **Lowcountry:** Not a consistently defined group, but usually includes Beaufort, Berkeley, Charleston, Colleton, Dorchester, Hampton, and Jasper

- **Pee Dee:** Chesterfield, Darlington, Dillon, Florence, Marion, and Marlboro