SOUTH CAROLINA’S MANUFACTURING RENAISSANCE:
An action plan for strengthening workforce development.
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EXECUTIVE SUMMARY

For more than a century, manufacturing has been the major economic driver in South Carolina. While many naysayers have predicted the demise of domestic industry in the State and in the nation, South Carolina’s manufacturing sector continues to be a major component of the State’s economy – representing more than one-fifth of the State’s gross domestic product.

Now, the tide may very well be turning. The word “re-shoring” has become part of our vernacular. World economic trends have companies either considering bringing production back to the U.S. or actually doing so. South Carolina has seen some of this trend and stands on the precipice of much more. Since the depths of the recession, South Carolina has recruited more than $19 billion in capital investment resulting in more than 64,000 new jobs in the manufacturing sector – making the State one of the fastest growing areas for industry. Nationally, manufacturers are experiencing a re-shoring phenomenon that is resulting in domestic reinvestment. Our State’s continued participation in this growth will depend on whether we can produce a skilled workforce capable of staffing modern factories with sophisticated processes and machinery. South Carolina has always met that need, and we continue to do so. The challenge, however, gets more difficult each year.

This report will help policy makers understand the overall economic impact of the manufacturing sector in South Carolina and the need for a long-term workforce development strategy designed to cultivate a skilled pool of manufacturing employees. This report includes testimonials from manufacturing executives where they provide first-hand evidence of their workforce needs, the challenges they face meeting those needs, and the role they need the State to play to ensure future competitiveness. They know what works, and they provide insight that can help South Carolina’s leaders prioritize workforce development spending.

This report is not a government-produced or government-centric document. Instead, the report represents the perspective of our State’s private sector employers. It is about industry perspective and the programs industry officials believe produce results. Beginning with the Technical College System and continuing with STEM, Work Ready Communities, apprenticeship programs, Dream It Do It, and other effective workforce readiness tools, this report provides a clear path for addressing this critical need. This report does not, however, call for specific budget appropriations but rather provides recommendations for broad categories of emphasis. We then hope the General Assembly and the Governor will consider future requests in the context of the information we provide herein.

South Carolina should be a leading participant in re-shoring. Developing our workforce will determine whether our participation becomes a reality.
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A manufacturing renaissance is occurring in the United States, and South Carolina has begun to participate in that rebirth. This State is poised to see growth that will continue our emergence from the depths of recent economic challenges that will establish new levels of prosperity for its citizens. The path to that prosperity, however, is not without its obstacles.

The largest of those barriers will be the development of a trainable and trained workforce. In fact, South Carolina’s participation in the re-shoring of manufacturing jobs to the United States is absolutely dependent upon a skilled workforce being available to industry.
We are not alone. Many other parts of the country face the same challenge, and as each area recognizes the need for skilled workers and moves aggressively to meet it, the risk grows that South Carolina will face a significant competitive disadvantage. Economists, manufacturers, government officials, and trade associations all see the looming crisis, and they are sounding the alarm.

Manufacturing matters. This economic sector has created the middle class, developed our nations’ infrastructure, and developed groundbreaking products ranging from personal computers, pharmaceuticals, automobiles, and airplanes to name a few.

Industry is the backbone that determines the strength and security of the United States. The economic downturn was difficult for the manufacturing industry, but what has emerged is an opportunity for a renewed direction for the sector.

Capital investments, productivity, and hiring are up despite the lingering uncertainty of the recent economic downturn. In 2012, manufacturers contributed $1.87 trillion to the U.S. economy, up from $1.73 trillion in 2011. For every $1.00 spent in manufacturing, another $1.48 is added to the economy – the highest multiplier effect for any economic sector. Today, manufacturing supports an estimated 17.2 million jobs in the United States – about one in six private-sector jobs, or nearly 12 million Americans (9% of the workforce).1

In a recent report from the U.S. Bureau of Economic Analysis, durable-goods manufacturing, finance and insurance, and wholesale trade were the leading contributors to U.S. economic growth in 2012.

1 National Association of Manufacturers
GROWTH

Manufacturing contributed more to economic growth than any sector.¹

- Manufacturing real value added—a measure of an industry’s contribution to GDP—rose 6.2 percent in 2012, after increasing 2.5 percent in 2011. Durable-goods manufacturing, the largest contributor to overall growth in the economy for the third consecutive year, increased 9.1 percent, after increasing 6.8 percent in 2011 and 13.3 percent in 2010.
- The finance and insurance industry group increased 3.6 percent in 2012, after two consecutive years of negative real value added growth.
- Wholesale trade increased 4.8 percent, after increasing 3.0 percent in 2011.

With this recent growth, manufacturers that are adding new machinery and are hiring continue to be plagued by the difficulty of finding a skilled and qualified workforce that can adequately meet their needs. Today’s manufacturers are more automated and productive than ever. Yet, finding talent that is highly skilled threatens momentum the industry is experiencing.

¹ US Bureau of Economic Analysis
THE SKILLS GAP

The 2011 “Skills Gap Study,” presented by the National Association of Manufacturers’ Manufacturing Institute, found that:

The hardest jobs to fill are those that have the biggest impact on performance.

Shortages in skilled production jobs — machinists, operators, craft workers, distributors, technicians, and more — are taking their toll on manufacturers’ ability to expand operations, drive innovation, and improve productivity. Unfortunately, these jobs require the most training, and are traditionally among the hardest manufacturing jobs to find existing talent to fill.

Seventy-four percent of respondents indicated that workforce shortages or skills deficiencies in skilled production roles are having a significant impact on their ability to expand operations or improve productivity.

While they recognize the importance of recruiting and developing talent, many manufacturers depend on outdated approaches for finding the right people, developing their employees’ skills, and improving their performance.

At a time when finding the right talent for the job has become so difficult, the spotlight shines even more brightly on recruitment and development efforts. If manufacturers can’t bring in talent with the skills they need, they can take steps to expand the skills base of their existing workforce. The reality is that while most manufacturers have some tools in place to address these challenges, they are depending on outdated, informal methods such as word-of-mouth recruiting. When it comes to training, there is also considerable room for improvement.

High unemployment is not making it easier to fill positions, particularly in the areas of skilled production and production support.

There’s no way around it: respondents report, on median, that 5% of their jobs remain unfilled simply because they can’t find people with the right skills. Translated to raw numbers, this means that as many as 600,000 jobs are going unfilled, a remarkable fact when the country is facing an unemployment rate that hovers above 9%. Respondents separately report that the national education curriculum is not producing workers with the basic skills they need — a trend not likely to improve in the near term.

The changing nature of manufacturing work is making it harder for talent to keep up.

Over the past five years, most manufacturers have redesigned and streamlined their production lines while implementing more process automation. In short, as the industry has changed, the nature of work that it requires is changing as well. It’s happening fast, and manufacturers will continue to expect more from their employees.

Respondents reported that the number one skills deficiency among their current employees is problem solving skills, making it difficult for current employees to adapt to changing needs.

The skills gap is expected to take the biggest toll on skilled production jobs, and will likely widen as time passes.

When asked where the skills gap is likely to hurt the most as respondents look to the future, they identify skilled production jobs by a wide margin. 80% of respondents indicated that machinists, operators, craft workers, distributors, and technician positions will be hardest hit by retirements in the upcoming years. At the same time, companies expect the skilled production group to be the hardest to find in the job market.

THE EXPERTS

The skills gap has been well documented in publications where manufacturers stress the urgency for workforce solutions:

1. “The manufacturing sector is clearly showing signs of the skills mismatch. It is likely to weigh on manufacturing growth. . . . There’s
a sharp divergence on what’s happening on the opening side of what’s happening on the hiring side.” Dean Maki, Chief United States Economist at Barclays in New York.

2. “Shortages in skill production jobs – machinists, operators, craft workers, distributors, technicians, and more – are taking their toll on manufacturers’ ability to expand operations, drive innovation and improve productivity. Seventy-four percent of respondents indicated that workforce shortages or skills deficiencies in skilled production roles are having a significant impact on their ability to expand operations or improve productivity. Unfortunately, these jobs require the most training and are traditionally among the hardest manufacturing jobs to find existing talent to fill.” Deloitte and The Manufacturing Institute, “Boiling Point? The skills gap in US manufacturing,” 2011.

3. According to the Federal Reserve’s April 11, 2012, Beige Book Business Survey, employers in half of the Federal Reserve’s 12 regions reported having difficulty finding qualified workers, especially for certain high skill positions.

4. Jeffrey Lacker, President of the Federal Reserve Bank of Richmond, blames much of the unemployment problem in this country from structural weaknesses like inadequate training which cannot be fixed by Fed policy. In a 2012 speech in Greensboro, North Carolina, he indicated that investing in job training education may more successfully address labor market weakness.

5. The tool and die industry is a particular chokepoint for the manufacturing community. This industry produces tools, dies, and molds that other manufacturers use to shape products. The downturn particularly affected tool and die makers. As a result, that portion of the workforce has not returned in significant numbers as of yet.

“It’s unquestionably a problem, and could slow re-shoring,” says Harry Moser, founder of the Re-shoring Initiative. . . . According to Dave Tilstone, head of the National Tool and Machining Association, 80% of the country’s 5800 tool and die firms are seeking one to five workers. He also indicates that fledgling workers typically complete for internships and then earn $60,000 a year:
“Unlike manufacturing workers who run mass production machines, tool and die makers take months to create a single, custom-designed part that’s used to crank out hundreds of thousands of a product’s components. Dies, for example, are steel forms that stamp out metal components such as car fenders and washing machine panels. Molds shaped plastic and ceramic parts such as dashboards and hairbrush handles.” Davidson, Paul, “Tool and Die Makers Desperately Calling for Workers,” USA Today, April 17, 2012.

6. In August 2012, it was estimated that nearly 1,000,000 United States manufacturing jobs were unfilled. Economic forecasts from the Manufacturers Alliance for Productivity and Innovation at that time predicted that manufacturing production would significantly outpace the overall economy and grow 3.4% that year, adding another 170,000 jobs. The National Association of Manufacturers estimates that nearly 2.7 million manufacturing workers will retire during the next decade thereby increasing demand for skilled labor. The jobs are there; the skilled workers are not. “As the last large publicly traded company in our industry still headquartered in the United States, we recognize training is critical to remaining competitive and rebuilding the middle class.” Cardoso, Carlos M. (Chairman, President and CEO of Kennametal Inc.), “Restructuring the American Dream Starts with the Manufacturing Middle Class,” The Cleveland Plain Dealer, August 12, 2012.

7. Western Pennsylvania manufacturers consistently report a shortage of skilled workers. The scarcity of skilled metalworkers is particularly acute in the Pittsburgh region where the employers

“For years, US manufacturers worried about business being sent overseas. Now, as signs point to a resurgence of American-made goods, a new fear is emerging: that there won’t be enough skilled workers to keep up with demand.”
-Emily Fox, CNN Money

8. The Iowa Workforce Development Director, Theresa Wahlert, believes Iowa faces a culture shift in its approach to matching businesses with workers who have the skills they need. Iowa has undertaken a program called Skilled Iowa to develop foundational skills among citizens.

“Our strategy is to roll out our technology in every high school in Iowa, so by the end of the year; we’ll have this kind of access for students from the ninth grade on and teachers from the ninth grade on, and counselors and parents, so they will have access not only to testing and teaching the fundamental skills but also to have the information about jobs, which they probably don’t have today...Are we really teaching to the content of what people really need to have a job?” Offner, Jim, “State Aims to Improve Skill Level of Workers,” Cedar Valley Business Monthly Online, August 9, 2012.

9. Infrastructure limitations and the fact that it can take a year or more to train highly skilled factory worker means that the current labor shortage could persist for several years. According to Sandra Krebsbach, Executive Director the American Technical Education Association, “Unlike 20 years ago, manufacturing today requires workers who are computer literate and skilled in computer aided design and engineering.” Kavilanz, Parja, “Manufacturing Boom: Trade School Enrollment Soars,” CNNMoney, July 31, 2012.

10. “For years, US manufacturers worried about business being sent overseas. Now, as signs point to a resurgence of American-made goods, a new fear is emerging: that there won’t be enough skilled workers to keep up with demand.” In an April 2012 survey of 259 manufacturers by MFG.com, 40% of respondents reported they had gotten business back that had been sent abroad. Costs are rising around the world, bringing parity for American manufacturers. Fox, Emily, “Can the US Handle a Manufacturing Comeback?” CNNMoney, July 23, 2012.

11. California is also experiencing a shortage of skilled workers. Even in counties where unemployment hovers around 8% and in a state with 10% unemployment, employers are finding it hard to recruit skilled workers. A 2012 survey by Manpower Group, where 40,000 employers in 39 countries were surveyed, indicated that US employers were having the most difficult time attracting skilled trade workers. Bussewitz, Cathy, “Employers Face Shortage of Skilled Workers,” The Press Democrat, July 8, 2012.

13. “Clearly, action is needed. Manufacturing employs 12 million people in jobs that provide pay and benefits well above the national average. It accounts for more than 10% of the country’s economy and 68% of its research and development investments. Keeping the sector healthy is critical to the country’s overall well-being. Yet, as globalization has ramped up international competition and technology has revolutionized the shop floor, many of those 12 million jobs have changed dramatically. Today’s manufacturers often rely on precision machinery, computer modeling and high-tech tooling far removed from the traditional assembly line, and too few American students are prepared for the skilled, internationally competitive jobs.” Haass, Richard and Klaus Kleinfeld, “Lack of Skilled Employees Hurting Manufacturing,” USA Today, July 3, 2012.

14. In the Spring of 2012, the Associated Press reported that up to half of all recent college graduates are jobless or underemployed, doing low-wage work outside their chosen field. Not all graduates, however, face those kinds of challenges. One student with an electrical engineering degree from the University of Texas at Austin had three job offers before he graduated in May. He took a job with Toshiba. The article also indicates the psychology is the third most popular four-year degree in Texas and one of the fastest-growing but there is almost no demand for that degree in the marketplace. “More than 5000 people graduated from Texas colleges and universities with bachelor’s degrees in psychology in 2010 . . . to compete for four job openings in the field, with an annual salary of $22,000. That’s not even enough to pay student loans back.” Hamilton, Tracy and Beth Brown, “College Grads Learning Good Jobs Hard to Find Now,” San Antonio Express News, July 1, 2012.

15. “The Manufacturing Skills Certification System, developed with manufacturing firms at the table, will give students the opportunity to earn manufacturing credentials that will travel across state lines, be valued by a range of employers and improve earning power. In designing this program, the Manufacturing Institute has partnered with leading manufacturing firms, the Gates Foundation, and the Lumina Foundation, and key players in education and training including ACT, the Society of Manufacturing Engineers, the American Welding Society, the National Institute of Metalworking Skills, and the Manufacturing Skill Standards Council. This will allow students and workers to access this manufacturing credentials and pathways
in community colleges in 30 states as a for credit program of study.”

The Manufacturing Institute, Press Release, June 8, 2011.

“This is about leveraging the knowledge of the current workforce to ensure a strong industrial base for years to come;” said Mark Tomlinson, Executive Director/CEO of the Society of Manufacturing Engineers. “The factory floor today is very different from what it used to be, and we need workers who are of the job,” according to Douglas K Woods, President of the Association for Manufacturing Technology. Mintchell, Gary, “Obama, SME Support Manufacturing Workforce Development,” Automation, Education, Manufacturing, June 27, 2011.

16. “This mismatch embodies the best and worst of American culture. On the one hand, American manufacturers have bested their international competition, becoming even more efficient at their recent struggles. On the other, there’s been a cultural shift that denigrates the value of manufacturing work, instead pushing young people into evermore impractical fields of study.” The manufacturing sector is also almost uniquely good to its employees. ‘No longer dirty, dark, or dangerous’ has become an industry catchphrase.

Careers in manufacturing are not, contrary to popular belief, merely monotonous assembly-line work; today, workers have to be good at problem solving, abstract thinking, and technology. And the pay is good. The Bureau of Labor Statistics reported that a manufacturing worker makes an average of $23.97 an hour as of October 2012. Manufacturing jobs are also more likely to come with good benefits than jobs in other industries, the Brookings Institute has reported.
Furthermore, the manufacturing sector offers high-pay positions for people with low educational attainment; one manufacturing firm told NATIONAL REVIEW ONLINE that it would pay a $54,000 starting salary to a high-school graduate who could competently repair and maintain machinery.”

“In high schools, there’s been such a focus on – and this is going to sound terrible – kids going to school...Not every kid is meant to go to college.” Meanwhile, manufacturing companies are paying six figures. You’ve got all these kids who are coming out of college, and they can’t find a job. It’s heartbreaking. Young people are told that a four-year college degree is a minimal requirement for career success, but the numbers simply don’t bear this out... Parents are making their kids go to college [according to Greg Rintala, head of Sales and Education for Snap on Tools Corporation]... College doesn’t equip them for anything but a liberal arts degree and how to be a barista anymore... There’s a lot of people out there with college degrees who just can’t find a job. They just don’t have the skills.” Mellchior, Jillian Kay, “American Mismatch,” National Review Online, November 26, 2012.

A report published by Ball State’s Center for Business and Economic Research highlights the obstacles and opportunities for attracting jobs in manufacturing in the South. According to Michael Hicks, the Center’s Director, “the actual demand for workers is going to increase even if the net number of jobs does not. As businesses are looking for employees to replace the turnover in manufacturing, they’re going to use education as a signal that they’re teachable people.” The Post and Courier, Melanie Balog; June 23, 2013
The U.S manufacturing industry is in the midst of a shifting global economy. The wage gap between Chinese and U.S labor forces has narrowed. The diminished value of the dollar over the past decade has made U.S-produced goods more competitive and climbing oil prices have made shipping of products across the ocean less appealing than domestically produced goods that are easy to ship cross-country. As a result, the manufacturing industry has begun the re-shoring of jobs that were once off-shored to low cost producers in China. An article released on May 21, 2013 in The Wall Street Journal titled, “Once Made in China: Jobs Trickle Back to U.S. Plants” highlights South Carolina as one of the key states targeted for exponential growth in the area of manufacturing.

“Re-shoring” is a hot word, entering the American manufacturing lexicon over the past couple of years at a rapid pace. Where the trend was once to send operations overseas to lower cost countries, that practice is waning, and as some would argue, it very well may be reversing course. “But re-shoring amounts to much more than public relations. It is being driven by powerful forces and will only get stronger. In a survey of American manufacturing companies by the Boston Consulting Group (BCG) in April 2012, 37% of those with annual sales above $1 billion said they were planning or actively considering shifting production facilities from China to America.” The Economist, “Re-Shoring Manufacturing: Coming Home,” May 14, 2013.

The focal point for the exodus of American manufacturing has been China, and although there are still strong reasons for operating in that country, some of its advantages are eroding. Principal among those are wages and benefits paid to workers. “The crucial change that has taken place over the past decade or so is that wages in low-cost countries have soared… Real wages in Asia between 2000 and 2008 rose by 7.1-7.8% a year. Pay for senior management in several emerging markets, such as China, Turkey and Brazil, now either matches or exceeds pay in America or Europe,” according to a recent study by the Hay Group, a consulting firm.

Pay in advanced economies, on the other hand, rose by just 0.5% to 0.9% a year between 2000 and 2008, says the McKinsey Global Institute. By contrast, pay and benefits for the average Chinese factory worker rose by 10% a year between 2000 and 2005 and speeded up to 19% a year between 2005 and 2010, according to BCG. The Chinese government has set a target for annual increases in the minimum wage of 13% until 2015. Strikes are becoming more frequent, and when they happen, says one executive, the government often tells the plant manager to meet workers’ demands immediately. The Economist, “Re-Shoring Manufacturing: Coming Home,” May 14, 2013.

Combine higher wages abroad, intellectual property and quality assurance concerns, logistics costs, and lower American production costs, and the re-shoring trend is picking up steam. The jobs are coming back. The question is, “Which states will participate in the re-shoring of manufacturing jobs and which ones will be left behind?” The answer will likely rest squarely on the ability of communities and states to prove and supply a trained workforce.

South Carolina is among the states that will have the infrastructure to facilitate the re-shoring of the manufacturing industry.
THE STATE OF MANUFACTURING IN SOUTH CAROLINA

South Carolina is home to a diverse group of manufacturing companies that produce a wide range of products used throughout the world. When viewed as an aggregate, it represents our State’s largest economic sector. Like the rest of the United States, South Carolina has recently experienced significant economic challenges, but is unique in that significant investments have been made in the past four years that show a resounding commitment to doing business here. Below is an overview of South Carolina’s manufacturing sector.
EMPLOYMENT

<table>
<thead>
<tr>
<th>INDUSTRY SECTOR</th>
<th>MARCH 2013</th>
<th>PREVIOUS MONTH</th>
<th>PREVIOUS YEAR</th>
<th>% CHANGE MONTH AGO</th>
<th>% CHANGE YEAR AGO</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOODS PRODUCING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Resources and Mining</td>
<td>3,800</td>
<td>3,800</td>
<td>3,900</td>
<td>0.00</td>
<td>-2.56</td>
</tr>
<tr>
<td>Construction</td>
<td>78,500</td>
<td>78,900</td>
<td>77,500</td>
<td>-0.51</td>
<td>1.29</td>
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<tr>
<td>Manufacturing</td>
<td>221,000</td>
<td>220,400</td>
<td>219,600</td>
<td>0.27</td>
<td>0.64</td>
</tr>
<tr>
<td>SERVICE PROVIDING</td>
<td>1,571,900</td>
<td>1,553,900</td>
<td>1,549,500</td>
<td>1.16</td>
<td>1.45</td>
</tr>
<tr>
<td>Trade, Transportation, and Utilities</td>
<td>353,900</td>
<td>352,000</td>
<td>349,500</td>
<td>0.54</td>
<td>1.26</td>
</tr>
<tr>
<td>Information</td>
<td>26,000</td>
<td>26,400</td>
<td>25,600</td>
<td>-1.52</td>
<td>1.56</td>
</tr>
<tr>
<td>Finance</td>
<td>101,500</td>
<td>99,900</td>
<td>97,300</td>
<td>1.60</td>
<td>4.32</td>
</tr>
<tr>
<td>Professional and Business Services</td>
<td>229,900</td>
<td>227,300</td>
<td>234,000</td>
<td>1.14</td>
<td>-1.75</td>
</tr>
<tr>
<td>Educational and Health Services</td>
<td>212,000</td>
<td>212,400</td>
<td>211,700</td>
<td>-0.19</td>
<td>0.14</td>
</tr>
<tr>
<td>Leisure and Hospitality</td>
<td>222,100</td>
<td>212,300</td>
<td>210,800</td>
<td>4.62</td>
<td>5.36</td>
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<tr>
<td>Other Services</td>
<td>69,200</td>
<td>68,500</td>
<td>69,000</td>
<td>1.02</td>
<td>0.29</td>
</tr>
</tbody>
</table>

TOTAL PRIVATE: 1,875,200, 1,857,000, 1,850,500, 0.98, 1.33

TOTAL NONFARM: 1,517,900, 1,501,900, 1,498,900, 1.07, 1.27

Source: US Department of Labor, Bureau and Statistics

WAGES AND PAYROLL

The manufacturing sector in South Carolina pays well compared to the average annual salary in the state. Manufacturers average an annual salary of $51,153 (2011) – up from the 2002 average of $37,604.

<table>
<thead>
<tr>
<th>South Carolina Industry</th>
<th>Average Annual Wages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine, Turbine, &amp; Power Transmission Equipment Manufacturing</td>
<td>$82,576</td>
</tr>
<tr>
<td>Pulp, Paper, and Paperboard Mills</td>
<td>$80,236</td>
</tr>
<tr>
<td>Iron and Steel Mills Manufacturing</td>
<td>$74,152</td>
</tr>
<tr>
<td>Basic Chemical Manufacturing</td>
<td>$73,736</td>
</tr>
<tr>
<td>Power Generation, Transmission, and Distribution</td>
<td>$72,644</td>
</tr>
<tr>
<td>Utilities</td>
<td>$66,872</td>
</tr>
<tr>
<td>Pharmaceutical and Medicine Manufacturing</td>
<td>$64,064</td>
</tr>
<tr>
<td>Machinery Manufacturing</td>
<td>$55,952</td>
</tr>
<tr>
<td>Resin, Synthetic Rubber, and Artificial Fibers Manufacturing</td>
<td>$55,692</td>
</tr>
<tr>
<td>Natural Gas Distribution</td>
<td>$54,860</td>
</tr>
<tr>
<td>Rubber Products Manufacturing</td>
<td>$53,196</td>
</tr>
<tr>
<td>Plastics Product Manufacturing</td>
<td>$50,700</td>
</tr>
<tr>
<td>Motor Vehicle Parts Manufacturing</td>
<td>$50,596</td>
</tr>
<tr>
<td>Residential Building Construction</td>
<td>$42,952</td>
</tr>
<tr>
<td>Textile Mills</td>
<td>$36,972</td>
</tr>
<tr>
<td>Grocery Stores</td>
<td>$19,136</td>
</tr>
<tr>
<td>Department Stores</td>
<td>$18,356</td>
</tr>
<tr>
<td>Accomodation &amp; Food Service</td>
<td>$15,964</td>
</tr>
</tbody>
</table>

Source: U.S. Department of Labor, Bureau of Labor and Statistics, SC Department of Employment and Workforce; 2012 Q3
**2008-2013 NEW JOBS AND CAPITAL INVESTMENTS**

Since 2008 to August 2013, South Carolina has recruited 64,650 new jobs and over $19.2 billion in capital investments. Investments occurred in 45 of the State’s 46 counties.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Jobs</th>
<th>Capital Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Materials</td>
<td>923</td>
<td>$479,893,650</td>
</tr>
<tr>
<td>Aerospace &amp; Aviation</td>
<td>9,417</td>
<td>$2,205,806,500</td>
</tr>
<tr>
<td>Alternative Energy</td>
<td>2,483</td>
<td>$1,426,100,000</td>
</tr>
<tr>
<td>Automotive</td>
<td>18,739</td>
<td>$7,619,203,257</td>
</tr>
<tr>
<td>Biotechnology</td>
<td>25</td>
<td>$50,600,000</td>
</tr>
<tr>
<td>Building Products</td>
<td>1,117</td>
<td>$27,038,500</td>
</tr>
<tr>
<td>Chemicals</td>
<td>874</td>
<td>$349,339,378</td>
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<tr>
<td>Electronics</td>
<td>308</td>
<td>$30,362,000</td>
</tr>
<tr>
<td>Food Processing</td>
<td>2,712</td>
<td>$596,911,807</td>
</tr>
<tr>
<td>General Manufacturing</td>
<td>4,186</td>
<td>$684,897,805</td>
</tr>
<tr>
<td>High Tech Manufacturing</td>
<td>4,409</td>
<td>$357,684,500</td>
</tr>
<tr>
<td>Information Services</td>
<td>78</td>
<td>$6,100,000</td>
</tr>
<tr>
<td>Marine</td>
<td>130</td>
<td>$13,621,000</td>
</tr>
<tr>
<td>Medical</td>
<td>2,133</td>
<td>$494,021,214</td>
</tr>
<tr>
<td>Metal Fabrication</td>
<td>3,978</td>
<td>$1,336,254,336</td>
</tr>
<tr>
<td>Non-Metallic Mineral Manufacturing</td>
<td>542</td>
<td>$382,000,000</td>
</tr>
<tr>
<td>Paper Products</td>
<td>2,171</td>
<td>$1,316,800,000</td>
</tr>
<tr>
<td>Plastics</td>
<td>3,612</td>
<td>$552,678,000</td>
</tr>
<tr>
<td>Recycling</td>
<td>1,224</td>
<td>$538,000,000</td>
</tr>
<tr>
<td>Textiles</td>
<td>4,015</td>
<td>$426,631,941</td>
</tr>
<tr>
<td>Warehouse and Distribution</td>
<td>153</td>
<td>$27,148,923</td>
</tr>
<tr>
<td>Wood Products</td>
<td>1,361</td>
<td>$323,207,000</td>
</tr>
</tbody>
</table>

**Grand Total** | 64,650 | $19,244,299,811

*Source: South Carolina Department of Commerce*
<table>
<thead>
<tr>
<th>County</th>
<th>Jobs</th>
<th>Capital Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lancaster</td>
<td>1,295</td>
<td>$217,166,000</td>
</tr>
<tr>
<td>Richland</td>
<td>2,113</td>
<td>$968,696,923</td>
</tr>
<tr>
<td>Marion</td>
<td>1,318</td>
<td>$135,870,000</td>
</tr>
<tr>
<td>Bamberg</td>
<td>335</td>
<td>$21,743,000</td>
</tr>
<tr>
<td>Horry</td>
<td>511</td>
<td>$58,700,000</td>
</tr>
<tr>
<td>Georgetown</td>
<td>637</td>
<td>$92,908,600</td>
</tr>
<tr>
<td>Charleston</td>
<td>8,666</td>
<td>$2,448,441,546</td>
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<tr>
<td>Colleton</td>
<td>160</td>
<td>$18,800,000</td>
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<tr>
<td>Berkeley</td>
<td>232</td>
<td>$430,744,923</td>
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<tr>
<td>Sumter</td>
<td>2,108</td>
<td>$561,799,600</td>
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<tr>
<td>Darlington</td>
<td>437</td>
<td>$471,655,231</td>
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<tr>
<td>Marion</td>
<td>2,988</td>
<td>$1,393,800,000</td>
</tr>
<tr>
<td>Spartanburg</td>
<td>7,162</td>
<td>$2,536,678,400</td>
</tr>
<tr>
<td>Spartanburg</td>
<td>7,162</td>
<td>$2,536,678,400</td>
</tr>
<tr>
<td>Spartanburg</td>
<td>7,162</td>
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</tr>
<tr>
<td>Spartanburg</td>
<td>7,162</td>
<td>$2,536,678,400</td>
</tr>
<tr>
<td>Spartanburg</td>
<td>7,162</td>
<td>$2,536,678,400</td>
</tr>
</tbody>
</table>
**CURRENT WORKFORCE**

South Carolina’s workforce is aging. According to this census data below, about 20% of South Carolina manufacturing employees are eligible for retirement in 5-10 years. The persons interviewed stated that 40-50% of their workforce could retire in 5-10 years.

**SOUTH CAROLINA MANUFACTURING WORKFORCE, BY AGE**

<table>
<thead>
<tr>
<th>Year</th>
<th>14-18</th>
<th>19-21</th>
<th>22-24</th>
<th>25-34</th>
<th>35-44</th>
<th>45-54</th>
<th>55-64</th>
<th>65-99</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>2,083</td>
<td>8,992</td>
<td>14,548</td>
<td>75,104</td>
<td>95,847</td>
<td>83,492</td>
<td>38,307</td>
<td>5,689</td>
</tr>
<tr>
<td>2002</td>
<td>1,721</td>
<td>6,821</td>
<td>12,216</td>
<td>67,105</td>
<td>88,273</td>
<td>79,255</td>
<td>38,139</td>
<td>5,529</td>
</tr>
<tr>
<td>2003</td>
<td>1,619</td>
<td>5,847</td>
<td>10,866</td>
<td>61,146</td>
<td>82,598</td>
<td>76,385</td>
<td>38,006</td>
<td>5,482</td>
</tr>
<tr>
<td>2004</td>
<td>1,652</td>
<td>5,378</td>
<td>9,979</td>
<td>57,114</td>
<td>79,633</td>
<td>75,811</td>
<td>38,481</td>
<td>5,673</td>
</tr>
<tr>
<td>2005</td>
<td>1,688</td>
<td>5,428</td>
<td>9,641</td>
<td>54,573</td>
<td>77,306</td>
<td>75,658</td>
<td>39,377</td>
<td>5,901</td>
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<tr>
<td>2006</td>
<td>1,709</td>
<td>5,740</td>
<td>9,355</td>
<td>51,479</td>
<td>74,458</td>
<td>74,360</td>
<td>39,540</td>
<td>6,184</td>
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<tr>
<td>2007</td>
<td>1,659</td>
<td>5,812</td>
<td>9,152</td>
<td>48,532</td>
<td>71,153</td>
<td>72,601</td>
<td>39,785</td>
<td>6,498</td>
</tr>
<tr>
<td>2008</td>
<td>1,501</td>
<td>5,520</td>
<td>9,066</td>
<td>46,483</td>
<td>68,578</td>
<td>71,769</td>
<td>40,633</td>
<td>6,550</td>
</tr>
<tr>
<td>2009</td>
<td>995</td>
<td>4,056</td>
<td>7,305</td>
<td>39,342</td>
<td>59,992</td>
<td>65,575</td>
<td>38,304</td>
<td>5,760</td>
</tr>
<tr>
<td>2010</td>
<td>781</td>
<td>3,667</td>
<td>6,651</td>
<td>36,724</td>
<td>56,303</td>
<td>63,997</td>
<td>38,073</td>
<td>5,567</td>
</tr>
<tr>
<td>2011</td>
<td>751</td>
<td>4,095</td>
<td>7,547</td>
<td>38,058</td>
<td>56,495</td>
<td>65,441</td>
<td>40,106</td>
<td>5,834</td>
</tr>
</tbody>
</table>

Source: US Census Bureau

**PERCENT EMPLOYED IN MANUFACTURING, BY AGE**

<table>
<thead>
<tr>
<th>Year</th>
<th>Under 25</th>
<th>25-54</th>
<th>55+</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>7.9</td>
<td>78.5</td>
<td>13.6</td>
</tr>
<tr>
<td>2002</td>
<td>6.9</td>
<td>78.5</td>
<td>14.6</td>
</tr>
<tr>
<td>2003</td>
<td>6.5</td>
<td>78.1</td>
<td>15.4</td>
</tr>
<tr>
<td>2004</td>
<td>6.2</td>
<td>77.7</td>
<td>16.1</td>
</tr>
<tr>
<td>2005</td>
<td>6.2</td>
<td>77.0</td>
<td>16.8</td>
</tr>
<tr>
<td>2006</td>
<td>6.4</td>
<td>76.2</td>
<td>17.4</td>
</tr>
<tr>
<td>2007</td>
<td>6.5</td>
<td>75.3</td>
<td>18.1</td>
</tr>
<tr>
<td>2008</td>
<td>6.4</td>
<td>74.7</td>
<td>18.9</td>
</tr>
<tr>
<td>2009</td>
<td>5.6</td>
<td>74.5</td>
<td>19.9</td>
</tr>
<tr>
<td>2010</td>
<td>5.2</td>
<td>74.2</td>
<td>20.6</td>
</tr>
<tr>
<td>2011</td>
<td>5.7</td>
<td>73.3</td>
<td>21.0</td>
</tr>
</tbody>
</table>
MANUFACTURING A SOLUTION
“For us to be successful in attracting good jobs for our citizens, we have to make the philosophical commitment to fund adequately and to manage appropriately our workforce development efforts.” - Bobby Hitt, SC Secretary of Commerce

Our labor force is growing – we have people migrating here looking for good work. There is no doubt about this growth – we’re one of the lucky states. We are small, but there are more reasons to live here than I can count. Others see opportunity here, and we are happy to provide it to them. At the same time, though, we need to train those folks who already live here, so that they too can take advantage of the many great manufacturing jobs that we will see over the next few years. We have to line up the right skills for the right jobs, so it’s very important that we focus on this training piece. In doing so, we meet the needs of new and existing industry, but we also send out a philosophical message to our existing companies that, if you invest in South Carolina, we will invest in our people and prepare them to work in your companies.

We owe that to the companies who come here and to the South Carolinians that desperately want to take advantage of these new jobs. When negotiating a possible location or expansion of a manufacturing facility, the quality and availability of a trained workforce comes up almost at the beginning. It isn’t necessarily the first thing we discuss, but it is always an early topic in our discussions. Availability in particular, becomes a paramount concern for larger companies. When these companies get closer to their investment decisions, how the State can meet the quality and capability issues is often decisive. South Carolina, among the site consultants with whom I talk, still has a reputation for an available and capable workforce. Workforce is not typically an impediment for us in our recruitment efforts, but from time to time, we will face challenges for specific parts of the State or for specific industries. Here, we look to the great success of readySC and the tech system in standing up a company and then being able to maintain their needs through the technical programs available to existing companies.

Twenty years ago, BMW had a huge level of confidence in readySC and the technical college system, which contributed to the decision to locate in the Upstate. After two decades on the ground in South Carolina now, the challenge is to begin replacing an initial competent workforce that is beginning to retire. BMW, like so many other manufacturers has assessed the type of training necessary to maintain the momentum of its current workforce. Fortunately, the technical college system excels in working with companies to stay current and to meet future needs.

Here, perhaps, I may have a little different perspective. readySC is front-end training, but I am convinced we also need a readySC for the back-end. Startup is such a huge energy burst – so much raw energy in the workforce – you can make up for a lot of gaps just through sheer energy. As you mature, you don’t have the same honeymoon and energy, so you have to look at your workforce in a different way. So we need an education system that meets both of those needs. readySC is a shining example of how well this State can work when it focuses on getting the job done. Economic development professionals and out competitors all over the country routinely consider us as the best in this field. I cannot praise the professionals in this area enough. When we sign a letter of intent, we trigger readySC, and the results are remarkable.
As I mentioned, though, we need to improve our work on the back end. We meet industry needs, but like all other states, we work very hard just to keep up. Like BMW, companies work hard to get set up and then sustain their workforces. Then, the workforce begins to look towards retirement. All of a sudden you realize you have to replace 25 people – some of whom are fairly critical. We need to have a system to help companies going through those changes – we’re going to see this more – we need a system where the companies and technical colleges can work together to identify those jobs and prepare folks to be able to properly fill those spots. The most important part of the partnership between technical colleges and manufacturers is that they are in the room together talking. That’s one of our great strengths – a small state and our relationships. We must allow those partnerships to grow and to flourish.

One area where there can be even greater collaboration between the private and public sectors is the marketing of manufacturing opportunities. We need to encourage people to begin their pathways toward manufacturing careers early in their education. STEM plays a key role in that journey. Manufacturers themselves have to do more in promoting the quality of the jobs they have. Manufacturing facilities are typically very closed places. The average person knows very little about what goes on inside a plant, and far too often, they do not know about the amazing careers and opportunities individuals can have through a technical degree.

Kids have one idea in their head and when they come on the ground and see, they get pretty excited about it. The men and women who build BMWs, Boeing planes, GE turbines, and Michelin tires… these people are very proud of the companies they work for and that they make something. You can keep going and going with the company names, but they make something, and they’re proud of that opportunity and to be able to identify with what they do. That’s who we are as a people and the way we have been for a long time. So we need to capitalize on that by giving people options – and at pretty young ages. Starting with Pathways to Progress that helps get all of these people together, so we can tell everybody we’re one of the great manufacturing states with people ready to do the work at the highest technical levels.

Make no mistake. The State of South Carolina has a big responsibility here. We have job positions for which we must find good candidates. Our job is to get people trained to fill these jobs. We have an obligation to train people from when they are young to prepare them for adulthood. Part of that training is to prepare them for a career. For us to be successful in attracting good jobs for our citizens, we have to make the philosophical commitment to fund adequately and to manage appropriately our workforce development efforts.

Remember who we are as a people. Men and women have been following their parents into jobs for generations. I was a third generation newspaperman. Here in South Carolina, we have an aptitude for making things – we like it, we’re good at it. It’s part of the fabric of who we are, and these may be very good times for us. The re-shoring of manufacturing jobs to the United States is picking up steam. Will South Carolina continue to participate in that trend? The answer will likely lie in whether we can train our people to be ready for those jobs.
In order to stay ahead of international competition, we will need more workers with post-secondary education/skills. A stronger medium skilled labor pool will increase the likelihood of attracting new companies and expanding those existing.

The associate degree is a good foundation, and the Mechatronics degree in particular is a good example to address high tech Maintenance skill requirements. South Carolina needs to develop and emphasize degree tracks for advanced manufacturing and supply chain management. South Carolina can develop these and many other skills by more aggressively pursuing a formal apprenticeship system/culture much like that we experience in Germany.

Our company believes strongly in workforce development, and we have invested our money accordingly in programs such as BMW Scholars program and significant financial outreach to K-12. South Carolina needs to continue to emphasize its technical college program, and that emphasis should include financial support and extend to other programs as well. We believe strongly in STEM education, MSSC, work ready communities, and of course adequate technical college funding. Establishing MSSC (or something similar) as a required entry requirement for production/logistics workers (similar to requiring an engineering degree for an engineer position) would be a very positive step for South Carolina industry and would also help focus the workforce training community in this State. South Carolina should also harmonize and formalize “Apprentice programs” to build a medium skilled talent pool. We believe the BMW Scholars program is a great blueprint for how this effort could unfold and succeed.

In addition to adequate funding, though, there are other issues the State should address to ensure an adequate 21st century manufacturing workforce exists. The technical colleges should collaborate more instead of competing with each other and reinventing the wheel. Mechatronics is a good example where the same curriculum exists across 5 colleges. The number of degree disciplines could be reduced to streamline programs and provide efficiencies (e.g., countless disciplines for industrial maintenance). We also need more integration and articulation between the continuing education and college degree divisions in the technical colleges. Find out what industry wants, and meet those needs. Adjust funding and financial assistance for our citizens accordingly.

Funding appears to be a challenge across the board for the Technical College System and individual Colleges. This challenge is making it more difficult for those institutions to address manufacturers’ needs in technology and preparing a skilled workforce. Through adequate and sustainable funding, better coordination between Colleges, and a clearer focus on industry endorsed job training and overall workforce development, we believe the Colleges can be well-positioned to meet the needs of other manufacturing facilities across South Carolina.
“If neither the State nor the United States has the readily available, highly skilled workforce necessary to compete, domestic and foreign companies will locate their manufacturing operations in locations where they can find people to staff their plants. The United States will become less capable of competing globally, and we will lose manufacturing jobs to overseas competition.” - Jack Jones, Vice President & General Manager

It is imperative that South Carolina lead in workforce development programs. Global competition in the aerospace industry is inevitable. Manufacturing workforce development initiatives will continue to be critical to create the environment for innovation/technology solutions to stay ahead of global competition.

The focus nationally over the last decades has been the outsourcing of manufacturing and related skills to other countries outside the United States. As a result, industry and government in the United States has placed less emphasis on required advanced manufacturing skills development. This trend has created a gap in the availability of a trained and readily available manufacturing workforce.

Manufacturing positions today require much more than the basic traditional “hands on” technical skills and education. Manufacturing skills today extend into large scale, highly automated, computer driven manufacturing technologies. The availability of technical college training programs (including composites manufacturing, model based definition, computer simulation, numerical control programming, and others) are vital to the success of the aerospace industry.

If neither the State nor the United States has the readily available, highly skilled workforce necessary to compete, domestic and foreign companies will locate their manufacturing operations in locations where they can find people to staff their plants. The United States will become less capable of competing globally, and we will lose manufacturing jobs to overseas competition.

Our experience in South Carolina has been very positive. Our partners have been readySC and Trident Technical College for the development and implementation of our detailed aircraft assembly training programs. These partners were actively involved in the development of the training program strategies. In addition, in the early stages of development and implementation, along with the ongoing sustainment operations, this team has continued to work “shoulder to shoulder” to continuously improve the training processes.

Utilizing the comprehensive multi-phased new hire training process, (developed in partnership with readySC and Trident Technical College), we have been able to attract, train, and hire all our aircraft fabrication, assembly, and field operations team members well ahead of our required need dates. Sufficient time was designed into the program to allow for detailed practice periods and on the job training. The detailed screening process conducted by readySC, based on jointly developed aptitude and basic skill requirements, provided candidates that could satisfactorily enter the program within a forecasted pass rate. Forecasted yields in applicants were planned into the screening process. Also, sufficient time was designed into the program to allow for detailed practice periods and on the job training.

Continued STEM focused programs are needed to sustain the pipeline of current aerospace production workforce needs. Additionally, as the South Carolina team continues, additional focus is needed to develop and retain the professional technical/engineering workforce. Undergraduate program emphasis in design engineering (mechanical and electrical engineering), manufacturing engineering, industrial
engineering and numerical control programming are key educational program focus areas. Advanced degree technical aerospace programs (including advanced composites technology) will become more important to our needs within the state. Availability of Airframe and Powerplant (A&P) certification programs will also continue to be important to the skill requirements. In secondary education, implementation of high school technical aerospace/STEM programs (like aerospace academies) will need to help sustain the future workforce pipeline.

Funding will be important. STEM programs and the technical college system should be top priorities for the State of South Carolina. This money will be a substantial part of the State’s economic development efforts, and it will enable South Carolina to create an environment where manufacturers will want to locate and expand.
“Our sector of the economy has been the ticket to the middle class for generations of people and very easily can continue to be so as long as we can give people the skills they need to work at companies like Milliken.” - John Kellam, General Director of Manufacturing

Milliken & Company has about 3500 associates across its various business units in South Carolina. As we have a number of workers retiring, we see a new generation that is going to need the skillsets required for our operations.

Our chemical operations have become a much larger part of Milliken & Co. As a result we have increased our headcount substantially in those facilities in the past 4 years. These increases are the result of new processes with a high degree of automation making operations more user-friendly, but also requiring more technical skills. As a result, we seek new talent that shows proficiency for working in this environment. The incoming associates often have grown up with personal computers and in a world more heavily saturated with technology, thus they have a natural aptitude for working with this automation. Automation may place some workers who are not as familiar with technology at a slight disadvantage, but that fact only emphasizes the need to train and educate our incumbent associates.

Milliken has an excellent reputation as an employer of choice, so we see some very qualified applicants. All have at least a high school education or equivalent, and many have 2 and 4 year degrees. Even those candidates with post-secondary education, though, often need technical training to be successful in their job search with Milliken. Chemical operations are definitely an area where South Carolina can and must do a better job in matching up the training of its workforce with the jobs that are available. In addition to the technical training, though, there needs to be more education about the true nature of modern manufacturing. Job seekers need to understand that there is great opportunity, but often that opportunity comes with a different approach to working. For example, we are a 24/7 operation, and prospective employees need to understand that the job will likely require working different shifts.

To address our future workforce needs, Milliken & Company, as has been its practice for decades, conducts an enormous amount of in-house training. We’ve been able to attract some very good talent, but the complicated nature of our work in specific areas such as our Chemical Operations requires additional training and education of our workforce. We believe other chemical and manufacturing companies experience the same issues.

We do see conversations about workforce development happening in many places across South Carolina. Organizations like the South Carolina Manufacturers Alliance, the South Carolina Chamber of Commerce, and SCMA’s Chemistry Council are moving together to address the workforce challenges. That needs to continue. Similarly, the State needs to streamline and focus its approach to workforce development. There currently seems to be a lot of agencies doing their own thing, and manufacturing doesn’t have the time to sift through the work of each. Coordination is essential.

We know that not everyone is going to go to college, and a number of essential and satisfying jobs in our society, particularly those in manufacturing, do not require a college degree. In order to ready the South Carolina workforce to take advantage of the opportunities we have in manufacturing, the K-12 system needs to send a clear message about what the real world of work looks like in the 21st century,
including providing comprehensive technical training. South Carolina should make funding our technical training and educating young people about manufacturing opportunities among its highest priorities. We must continue emphasis on Work Ready Communities and STEM education programs should be implemented throughout the State. We will be looking particularly hard for people with good STEM backgrounds for manufacturing positions in the future. Finally, chemical operator certification programs should exist in those areas where the State has a high concentration of chemical operations. The wages for these jobs are very good, and we will continue to need more qualified people.

South Carolina has a lot going for it, and we can continue to be a prime environment for future investment. Too many South Carolinians, however, do not have the skills to take advantage of the opportunities present in manufacturing. Our sector of the economy has been the ticket to the middle class for generations of people and very easily can continue to be so as long as we can give people the skills they need to work at companies like Milliken & Company.
In our Clover facility, we are in the 45-50% range for folks nearing retirement. Like many manufacturers, we have a lot of long-tenured employees, and we will see many of them exit the workplace in the near future. Obviously, workforce development is a key issue for us. Our future success in South Carolina will depend upon not only finding the right people with the right skill sets for our future but also effectively transitioning skills and knowledge from the current workforce to the future workforce.

Our business uses CNC grinding, laser, and waterjet technology. In the past few years, the demands in this industry have changed dramatically. Customers, like GE, need more precise manufacturing than ever before. We've had to adapt with technology too. The CNC machine of the ‘80/’90s is nothing like what we use today. We're building and using machinery that requires complicated computer programs, and 3D modeling of the machinery. The skill levels needed operate this machinery - and ensure that it works properly - are very difficult to find, and takes time to cultivate. Our concern is that we're not going to have the individuals we need as we grow our business and see turnover due to retirement. If we do find them, it's going to be difficult to get them to come to work here because of our location or it's going to be difficult to keep them here because it may be more attractive to work for a larger manufacturer.

Re-shoring of manufacturing jobs to this country will occur only if we have an adequate workforce. This idea is the forefront of all national discussions. As President of the Society of Manufacturing Engineers (SME), I've heard stories of manufacturers of all sizes across the nation express a tremendous amount of concern about the industry not being able to find the skilled workers they need. No one seems to have a comprehensive solution. To tackle this issue, we need to emphasize STEM related education, do all that we can to excite students about this subject material, and demonstrate to them the pathway towards a manufacturing-related career. STEM, MSSC Work Ready communities, and our technical colleges are all great programs or great pathways to a well-trained workforce. I am more familiar with STEM, as that is a big focus area my company believes schools should emphasize. STEM is the fundamental component of manufacturing. This has to be front and center for us to be able to be competitive and ready to meet the needs of the future. STEM related programs like SME's PRIME School, Project Lead the Way and Skills USA are excellent national models for encouraging kids to pursue engineering careers.

Everyone is facing the workforce issues we are having in South Carolina, including filling the pipeline with workers manufacturers need. My impression is that although the many programs and efforts out there that try to address this issue are noble in intent, there is no centralized strategy or approach that a region/State is pursuing that has a long-term goal. Public/Private partnerships, coordination, and effective funding that fill the specific needs identified by manufacturers. That's where we need to focus. If South Carolina can do these things, we will have the upper hand.

“Re-shoring of manufacturing jobs to this country will occur only if we have an adequate workforce.”
-Dennis Bray, President & CEO
SCANA is a company in which people love to grow old. At Summer Station for instance, it is not unusual for folks to be there 20-30 years. A quarter of our ‘production’ folks are in a retirement window now of 5-10 years. That number could possibly be as much as 35-40% depending on the economy. When those people retire, we will lose a lot of institutional knowledge and a ton of skills. We will have a difficult time to develop programs that make up for those losses. We have a task of developing leaders, but our new people are not going to have the institutional knowledge even through job shadowing, which we cannot always do effectively anyway. We are partnering with technical colleges and using intern and co-op programs. Exposure to the company through these programs is a good way to bring folks in through entry level positions.

We have had very good success with the technical college system. I truly believe that it is one of the best of its kind in the nation. We have partnered with them to develop a curriculum, and they have then developed programs to meet our needs – basically creating a major that addresses the skills we must have. We have never gotten any indication from the technical colleges that they could not create a program or work with us.

Today’s millennials may be so much more technologically advanced, but they are not necessarily heading in our direction for careers. We have to find innovative methods to capture their interests and attention in learning these skills. Sitting in a classroom for 8 hours looking at PowerPoint slides doesn’t cut it anymore.

How we train them is important – podcasts, other technologies, etc – but it still doesn’t guarantee the caliber of person you want. We need a completely different approach – foundational across the board and very specific to industry. South Carolina must also spend some time and resources on developing soft skills. The younger generation has a great deficiency in this area. There is an entitlement attitude. They come in expecting credibility and respect be given to them; whereas, we expect it to be earned. When they come in the door it’s as if they think they are doing you a favor. This is an issue that we’re going to have to consider when considering how we’re going to train our future employees.

Soft skills seems to be the last thing on the list – we can do all of this innovative training, implement world-class programs, etc., but when you are in leadership meetings, you are usually dealing with people issues. Soft skills are so underestimated, but it’s the core – attendance and personal interaction are big issues for us. Seldom is it that someone cannot grasp the technology. We need better soft skills to go with that technical know-how.

“Soft skills are so underestimated, but it’s the core – attendance and personal interaction are big issues for us.”
- Tom Trively, Manager, Workforce Development
Fujifilm built its first factory in South Carolina in 1988 and since that time we have built 7 additional factories and a national distribution center. Many of our employees have been with the company for over 20 years. Therefore, we have a fairly mature workforce which will need to be replaced in the coming years as our existing workforce approaches retirement age.

Because our photographic and imaging products are very specialized and the workplace skills that we needed did not exist in South Carolina it was necessary for Fujifilm to develop extensive in-house training for the majority of our Associates. Much of this training was developed with the assistance of the technical college system. Since the company is prepared to provide specialized in-house training we look for employees with basic math skills, problem solving skills, and the ability to work in teams. Above all else we look for employees with demonstrative employability skills such a commitment to hard work, loyalty, punctuality, and a willingness to learn new skills. Any employee with these skills can have a very successful and long career in manufacturing. Technology is changing rapidly and Fujifilm is committed to staying on the leading edge of manufacturing technology so an employee with these basic skills can continue to thrive and progress in an advanced manufacturing environment.

Other areas where we see an increasing need is in basic maintenance technicians, electrical technicians, and mechanical technicians. These are advanced skills that can translate across different manufacturing industries and yet there always seems to be a shortage of qualified maintenance engineers. We would like to see the State continue to develop programs to train potential employees in these areas. We are also looking to the university system to train more mechanical, chemical, and electrical engineers who are willing to stay in the State to support our local industries.

I'd like to see workforce development a more centralized issue in the whole economic development debate. What I mean by that is, South Carolina has an incredible opportunity to attract high tech manufacturers – the kind that we want – and the only way we are going to be able to do that is through an approach that fills the pipeline of workers who are trained to do the job. I'm concerned that there is not enough emphasis on the quality of jobs manufacturing produces. We need more public relations efforts to tell the stories of the incredible benefits there are in manufacturing careers. If we can get the kids interested and provide them with the skills necessary, we can meet manufacturing needs and dramatically improve our State's economy.
Cox Industries is in a niche market. Our product is what it is – pressure treated wood. The product itself will not get more sophisticated, but the process will. That means more technologically advanced machinery and advancements in the treating process. We’ll need individuals who can ensure that the maintenance on the machinery meets the needs of the business output.

On a macro level, an adequate workforce, both in terms of quality and quantity, will be an essential component of continuing the recent trend of re-shoring manufacturing jobs to this country. What the United States can achieve through the re-shoring opportunities will only be successful if we can ensure the workforce meets the needs of the companies’ product lines. The stories about job openings across the nation are discouraging because people are out of work and I know they want to work — they just don’t have the skills to meet the demands of those job openings. We need a short-term and long-term approach to handle the manufacturing workforce. Solutions to this problem have been overlooked for too long, and now that the United States has an opportunity to grow our manufacturing base significantly, something that hasn’t happened in a long time, we’re finding ourselves at a tremendous disadvantage.

South Carolina should emphasize STEM, Work Ready Communities, MSSC, and technical college funding in general. I am really excited to see what Work Ready Communities will produce. For too long everyone has been disconnected and has not been working together. By South Carolina being one of the first states to be in this pilot program — I think, once it is up and running on full steam, we’re going to have something to brag about to the rest of the nation.

Making students aware of the benefits of a manufacturing career is one of the most essential tasks before us. We continue to miss out on steering young people who would be good manufacturing employees toward that path.

Cox Industries employs a number of technical college graduates, and we have been very pleased with them. We will be looking for other partnership opportunities with them in the future, so we need them to be stable financially and able to work with us.

Finally, coordination of workforce efforts in this State is essential. Some areas have adequate money, but it isn’t spent well. It is ironic that the technical college system is such an effective mechanism for training our citizens and yet has to struggle mightily for its funding. At the same time, agencies that do not perform as well seem to have the resources. Let’s get that equation right and emphasize the tech system where excellence seems to be a way of life.

“Making students aware of the benefits of a manufacturing career is one of the most essential tasks before us.”
- Mikee Johnson, President & CEO
“Our manufacturing workforce is extremely talented. A key factor in our success is their expertise and their passion for our customers, our products, and continuous improvement.” - Paula Martin, Greenville Manufacturing Plant Manager, GE Power & Water

The manufacturing segment in South Carolina faces a significant workforce challenge in the next few years, and GE’s Greenville facility is no exception. In Greenville we manufacture, assemble, and test heavy duty gas turbines. These turbines are used to generate electricity or to drive industrial equipment. Gas turbines are extremely sophisticated and as a result the manufacturing processes required to make them are also sophisticated. A gas turbine can weigh up to 300 tons, and the rotor spins at 3600 rpm, with variation less than ¼ the thickness of a human hair.

Technology continues to increase in our product and in our processes. We use lasers, precise measuring equipment, conventional and nonconventional machining, robotics, and high temperature coating processes. Our manufacturing workforce is extremely talented. A key factor in our success is their expertise and their passion for our customers, our products, and continuous improvement. In addition to expertise in machining, fabrication, and assembly, we require individuals who can problem-solve and constantly generate ideas on how we can improve our processes.

Most of the individuals in our hourly workforce have 15 years or more experience and up to 45% are eligible to retire in the next 10 years. As experienced employees retire, we are faced with replacing them. Recruiting talented, motivated, and qualified employees in the coming years is a very real and serious issue for us.

We have hired 150 people in the last two years, and finding the right talent proved difficult. For every person that was hired, there were 40 people that initially applied. Screening candidates is time consuming and costly. The biggest gap for the unsuccessful candidates was a lack of the fundamental skills required for our jobs.

GE has taken a pro-active step to closing the gap by launching a machinist apprentice program in 2012 in partnership with Greenville Tech. GE pays for tuition and salary during the 2 year program. 27 machinists are now enrolled. Partnering with South Carolina’s technical college system has been a key success factor for us in the past, and will continue to be important in the future. We are very pleased with the help they have provided over the years with training curriculum and workforce development, and in the success thus far in our new apprentice program.

Although we are excited about the apprentice program, it’s not enough. We need more young people enrolling in manufacturing programs in both high school and secondary school. We need facilities that are up-to-date and well-staffed to teach students the latest manufacturing technologies. And we need more education and communication about the benefits of manufacturing jobs including pay and benefits. Manufacturing is good for the economy and good for SC, but we need to ensure that we have the workforce to support it, both today and tomorrow.
“If the State will train people with the skills we need, I truly believe the jobs will be there for them.”
- Charles Hamrick, Treasurer

The textile industry is experiencing something of a revitalization in South Carolina, and although we will likely never again see the mammoth sized mills that were prevalent a few short decades ago, there are going to be very good employment opportunities in our industry for South Carolinians – good jobs with great pay and benefits. In addition to that, the textile industry will need people due to the age of its current workforce. Many of our employees have been with us for a very long time, and we expect that at least 30-50% of our current workforce will be eligible for retirement in the next 5-10 years.

Our biggest challenge in many respects is that most people do not think of textiles as advanced manufacturing. In reality, though, today’s textile industry is not your grandfather’s or father’s textile industry. Some of the most sophisticated products made in this State are textile products. Even when the product is tried and true such as cotton thread or basic fabric, the processes by which those items are made are much more advanced. At Hamrick Mills, as the complexity of the processes and the machinery has increased, we have kept pace by training and retraining our employees. As those employees retire, though, we will face a greater challenge to bring in qualified people with the skill sets we need.

Fortunately, we have a good relationship with the local technical college, and we run a successful co-op program. Those efforts have met our needs to date, but we will need to ramp those up in the coming years. Likewise, we will need the State of South Carolina to do its part to provide us with a qualified workforce. We will count on work ready communities and the efforts to spread work keys certifications to as many individuals as possible. Similarly, the schools need to emphasize STEM programs and funding for those programs should be a top priority. Finally, both private and public entities need to increase the general awareness among our students of manufacturing needs and the job opportunities available. Manufacturing in general and textiles in particular do some amazing things, but it’s just not attractive for some reason to the younger generation. So many young people would rather work in retail, or do something that they think of as “cool.” I am baffled by those who would rather make minimum wage than go through a short program at Tech and get a significantly higher paying job.

While I believe strongly in adequate funding for our workforce efforts, I do want to see coordination and accountability. Where is the money going, and how well is it being spent? I should never hear about funding woes for the technical college system, as that area of State government should be at the top of the priority list. If the State will train people with the skills we need, I truly believe the jobs will be there for them. Our technical college system is the most effective delivery mechanism for workforce training. Invest in it and you will see results.
“Our manufacturing process has changed dramatically in the past few decades. We are a high-tech, research-driven, and automated industry.” - Rob Chapman, Chairman, CEO & Treasurer

Inman Mills is much like most textile manufacturers today – we will face a significant turnover in employees due to retirement in the near future. Our greatest concerns are the loss of institutional knowledge due to retirement and the false pretense that the textile industry is dying. In reality, nothing could be farther from the truth; however, tackling these misconceptions and encouraging employable youth to join our workforce is a challenge.

Our manufacturing process has changed dramatically in the past few decades. We are a high-tech, research-driven, and automated industry. Additionally, the machinery used in today’s textile industry is more complicated, costly and demands proper usage to produce a quality product. Many in our workforce have been with us for a significant amount of time – they have grown with the changes in the company and have gone through extensive retraining, when required. The next generation of workers know very little about textiles, as most consider this industry a dinosaur. In order to survive and prosper, our company needs to join with the State of South Carolina in changing this image and provide our youth with accurate information as well as the training they need in order to succeed. Subsequently, parents and teachers should encourage students to pursue a technical education that would in turn lead to manufacturing careers. We must make sure we can staff our plants with qualified workers or the plants and jobs will go elsewhere.

To address future workforce requirements, Inman Mills is working closely with Spartanburg Community College. In addition, public awareness, the voice of the private sector, and state input would help in transforming the textile image today. Together we can revolutionize the image.

In conclusion, it is of utmost importance that we work together to ensure adequate support and funding for the technical college system which in turn will provide our technical workforce of the future.
“Today’s advanced manufacturing world is much more challenging than twenty years ago. We need a highly skilled, diverse workforce with teamwork skills.” - Steve Burry, HR Manager

Our general turnover rate is very low, averaging approximately 4%. Our average tenure is 13 years. We anticipate a retirement wave in the near future due to an aging workforce. Approximately 35% of our employees will be eligible for retirement in the next five years. That situation, combined with our growth in this State, will create a challenge to ensure that we have an adequate workforce for our facilities.

South Carolina is a great place to do business. We have announced expansions in Lexington and Anderson as well as a new earthmoving plant in Anderson. We have invested $1.15 Billion in the last 21 months, creating 870 new jobs and increasing to 9 facilities in South Carolina. We will have approximately 9000 Michelin Employees on completion of construction. Michelin is not the only company expanding and building. According to the South Carolina Department of Commerce, 210 manufacturing firms committed to invest $7.9 billion from 2011-2012. These investments are expected to create 20,000 new manufacturing jobs in the state. This growth is good news, but it will result in a shortage of qualified workers in wage production positions and especially in the highly skilled automation technicians.

Today’s advanced manufacturing world is much more challenging than twenty years ago. We need a highly skilled, diverse workforce with teamwork skills. Tires are a very complex product, and finding people with the right skill set to work on our machines and robots is becoming more difficult. Advanced manufacturing demands people with mechanical skills and robotics experience to operate and maintain our equipment. As manufacturing becomes more automated, the demand for workers with this unique skill set will continue to grow. “In a fast changing global economy with new employment needs and career opportunities continuously emerging, the need for collaboration between industry and a well-prepared workforce intensifies. Last year, Michelin North America announced it will expand its Earthmover tire production in South Carolina with a $750 million investment expected to generate 500 new jobs. Michelin has been collaborating with South Carolina school districts to create a supply chain of technical talent to fill many of these new positions.

We are just one example of how industry can take the lead in preparing highly skilled workers by teaming with the educational community to engage students. For the past year, we have been partnering with Lexington School District One and Lexington-Richland School District Five and Midlands Technical College to recruit and develop technical talent. ‘It became very clear to us, that to be successful in the long term, we needed to adapt our hiring process and think differently about how we go about developing and recruiting the necessary people to meet our needs. The first realization for us was that we could not go about this alone,’ says Peter Sutton, site manager for Michelin Lexington.

A key factor to prompting students’ interest in these highly technical fields is making learning opportunities available to them through their school curriculum. By aligning educational curricula with the current industrial opportunities, we have begun exposing children and young adults to technology, science, and engineering earlier in their education.

This model is a tremendous success story for both Michelin and the Lexington educational community. Currently we have a cross-functional team of about 20 people, all of whom are dedicated to creating a pipeline of future employees. The team includes representatives from the
Lexington School District One, Lexington-Richland Five District, Midlands Technical College, and Michelin. It is a very talented, professional team. The goal is to establish a human supply chain of technical talent from high school through technical college and on to Michelin for great future careers in our industrial facilities.

The team is focused on alignment of three major areas: curriculum, assessments, and branding/marketing. Taking these courses in high school allows students to begin exciting career paths for life. We demonstrate our value and appreciation for these students as they attend Midlands Technical College and are accepted into the Michelin Scholars Program by providing financial assistance. Michelin funds tuition and books as well as provides part-time work with competitive pay and benefits. Successful Michelin Scholars can become full time Michelin employees, making more than $50,000 per year upon completion of their education. In addition, Michelin full-time employees are given 2,000 hours of technical training in their career, and they are offered an award-winning benefits package.

STEM initiatives, Work Keys, and the Manufacturing Skill Standards Council (MSSC) are all very important to our future in this State. The hiring pool of candidates today is much different from 15 years ago. The pool of experienced manufacturing candidates is very limited. We hire many today from the service industry or logistics. We spend 2 months orienting employees to the manufacturing world. The MSSC core knowledge and skill areas in Safety, Quality Practices and Measurement, Manufacturing Processes and Production, and Maintenance Awareness would better prepare the candidates for manufacturing.

What concerns us most is the tech schools and high school technology centers (old vocational school). We rely heavily on them for our manufacturing technical workforce for the future. To connect from a high school technology center and technical college classroom to the needs of industry, we still need to make substantial improvement. There are two primary needs. First is technology resources, and equipment to teach the practical world of manufacturing. The other is qualified instructors to meet the growing needs. These needs require funding and should be priorities for the State.
“For most of the surveys we’ve seen, you do not find many middle or high school students that say they, ‘want to go work in a factory’. Awareness of the opportunities in Aiken County is important…Getting that message out to students and teachers should be a priority.” - John Stewart, Plant Manager & Mike Uhle, Human Resources Director

Bridgestone has been in Aiken for more than 14 years now, and we are currently growing substantially. Prior to the expansion, the number of teammates we had was 942, and since, we have hired around 150 plus individuals, bringing our employee count to 1,118. The average age of the teammates is about 41 years old. We are not facing an imminent issue with retirement, but our expansion will require a large number of new, skilled workers.

We do pre-employment testing, but we do not use work keys. Our process evaluates both behavioral assessments and technical skills. Then, we do behavioral interviews. Once a person is selected, we do a week and a half orientation that is very thorough. The training is broad based: teamwork, benefits, forklift (this is something the technical school and readySC helps us with), measurements, industrial engineering, finance (how a plant runs from a financial standpoint). From there, they go to the floor and have a combination of in-class or on the job training depending on what type of machine they will be operating. So, it could be as much as an additional two weeks of training on top of the initial orientation.

For maintenance workers, we use the same test to screen the applicants, but they go through the same orientation as the production teammates. The maintenance team members have a high level of technical abilities. They are incorporated into a day shift job working alongside our current maintenance teammates where they will be responsible for answering calls – their primary responsibility is troubleshooting to keep the machines running. These individuals are difficult to find. We have a better success story than most because we have a really good recruiter here. They are still hard to find due to the level of technical skills needed and the right soft skills that will be a good fit in our team. All of our maintenance folks are required to be multi-craft, so we won’t just hire an electrician -- they have to be knowledgeable in electrical, electronics, and mechanical fields.

We do sometimes have to go outside of the region to find these folks. Outside of the expansion, we have tried to stay local. We have had a lot of success, especially from the military, particularly the Navy nuclear program. The multi-skill part is very hard to find. We get applicants that are really good and highly skilled in one area, but the work we require is multidimensional. The primary problem we have is the multi-skill requirement and the ability to troubleshoot.

We are very proud of and satisfied with our relationship with Aiken Tech. The tech staff wants to give us students who they graduate that can work in our facility. The main thing Aiken Tech needs is a building that we’re helping to fund (Center for Energy and Advanced Manufacturing), but the other thing they need is good high tech equipment. The tech scholar program with Aiken Tech has been really good in terms of reliability and loyalty to the company, and they have a high pass rate once they graduate. This has helped backfill our attrition.

High voltage training is something they are not able to do at Aiken Tech, and this would be a valuable program for the type of manufacturing we do. We think the reason for not being able to do the high voltage training is equipment availability – there are safety concerns about a
program like that, but money is another factor. Aiken Tech has a very small amount of equipment that is just enough to train on, but they’re not going to have the latest PLCs, robotics. These items should be addressed by the State in its funding priorities.

For most of the surveys we’ve seen, you do not find many middle or high school students that say they, “want to go work in a factory.” Awareness of the opportunities in Aiken County is important. MTU, Kimberly-Clark -- these are good companies that provide good jobs.

Getting that message out to students and teachers should be a priority. We’ve done some tours with 8th graders, and most of them appear to be very surprised and excited once they are here. They seem to have an image of when their parents or grandparents worked in the mill. Generally, they leave the tour experience with a positive outlook about manufacturing. We’re trying to show that it’s kind of cool to work in a place like this.
At Nucor-Berkeley, we have 930 employees, of which about 750-800 are manufacturers. Currently, our average age at the facility is 37-38. About a dozen people retire each year. We have a difficult time replacing those individuals that retire, and this problem exists throughout Nucor. It is very difficult to transfer knowledge from people who have been with the company for a long time that understand our company and culture. Because of this difficulty, we do a lot of on the job training so that people know what's going on, why it's happening, our processes, etc.

It is also very difficult to match new hires with the skills we need. On the maintenance side, we need very high level mechanical and electrical skills, and we really need those people to walk in the door with those skills from day one. On the production side, we have a little more flexibility, because we do not require a very strict skill level due to our ability to conduct a lot of on-the-job training. Still, finding individuals who can work well in our environment and adhere to the company's principles can be a challenge.

With the new line that we will add soon, we'll likely transfer people to this new line that will use the new technology. We will post internally, then backfill the vacancies. We will need qualified individuals who can fill those newly created vacancies. There is more competition in the Lowcountry now for those kind of employees, so the task of finding them will not be easy. We will need the technical college to be effective in providing them to us.

We are working with The Citadel in the electrical engineering field. They have supplied some high quality intern candidates that have become full-time employees. On the mechanical side, we have been working a lot with USC, and we have a similar story to that of The Citadel. By and large, though, we are going to need more of these partnerships with the State. Funding will be an issue, and we believe the State will need to make the investments required to produce adequately skilled people.

All employers are going to struggle with finding individuals who understand the value of a good career. There's a generational dynamic here that employers are going to have to work through where young people have a tough time understanding that right out of college you're not going to usually make $60,000/year and have a month of vacation. The perception of what it takes to have a good career in manufacturing or a related field doesn't seem to match the realities of the job's demands. There needs to be a much more aggressive effort to educate kids on these opportunities and on the steps they need to take to realize them.

“The perception of what it takes to have a good career in manufacturing or a related field doesn’t seem to match the realities of the job’s demands. There needs to be a much more aggressive effort to educate kids on these opportunities and on the steps they need to take to realize them.” - Nicole Santana, Human Resources Supervisor, Nucor Steel - Berkeley
The average age of our Charleston Plant workforce is approximately 47 years old. We anticipate losing a significant number of professionals and skilled technicians (mechanics) to retirement by 2020. We will need to be aggressive to replace that talent, and with the growth of the manufacturing sector in this area, there will be a lot of competition for skilled people in industry. If you are a skilled worker over the next decade or so, you will really be in a seller’s market.

Our operations are certainly high tech. We are heavily automated. We do have machining here, but there has been an increase in high speed automated assembly lines. Obviously, the most important issue for us is ensuring those lines run as planned. In order to make that happen, we need the technicians. In the past 18-20 months, we have done more recruiting for skilled technicians, primarily in the Tri-county area, but we have also opened recruiting efforts to other areas of the state and to other states. Approximately 90% of the people we have hired recently in skilled labor positions have been from the Tri-county area.

We have been able to find candidates to fill those jobs, but there is not an unlimited supply. We would prefer associates to go through our apprenticeship program, but because of the number of technicians needed, we cannot accomplish that amount of in-house training. That concerns us, because we believe there will be a greater need for technicians as the machinery becomes more technologically advanced. Training them will be a priority, and we need more people to begin our employment process with the basic skills we need.

Unfortunately, there is still a misperception in the general public about manufacturing career paths. Many parents and students see 4-year college as the only answer, when in reality, the great, challenging, well-paying jobs are right here in our facilities. The State needs to emphasize STEM education, but first and foremost, we need to develop interest among high school kids in the opportunities manufacturing affords. The education community itself needs to learn more about those opportunities so that it can give students better guidance about what is really out there for them.

I recommend considering a German-style apprenticeship program as a model for South Carolina. That program tends to go in the direction of mechatronics which is a good working combination of fundamental understanding of mechanical and electrical disciplines. Many manufacturing companies could benefit from a strong mechatronics program in the Lowcountry educational system. As for STEM, it is a fundamental component of manufacturing-related education.

The technical college system is a very good partner for us, and our relationship goes back over 30 years. Our apprenticeship program has been successful because of that partnership. They have also shown us that they can help with other sources of training and skills development we need. Our relationship with them has never been ‘that’s something we can’t do’ but is instead ‘let’s find a way to do it.’

There are challenges, though, for the technical college system. One of the greatest risks we see is their ability to retain very good, qualified instructors. We fear some private industry will lure them away because of better pay/benefits. We think we could see more and more turnover from those instructors in the near future. Funding for equipment, curriculum, and good instructors is essential. The State of South Carolina cannot afford to drop the ball in this area.
Finally, awareness of manufacturing opportunities has to be a big priority. People in Charleston traditionally have not been as tied to manufacturing, and yet, with all of the opportunities here, they should be. Manufacturers are going to make products and make significant contributions to local communities, but without a qualified workforce, they will do that work somewhere else.

A qualified workforce is the most fundamental component to any manufacturing business. If South Carolina and the United States do not properly address the soon-to-be issues with workforce development, we’re going to miss incredible opportunities to grow our economy in a meaningful and lasting way.
“We estimate that half of our South Carolina workers will either be retirement eligible or will actually take retirement over the next 10 years.” - Allison Honeycutt, Director of Workforce Strategy

Duke Energy has been very fortunate to have an extremely dedicated workforce with very long career spans. We are, however, entering into a time when many of those people are going to retire. We estimate that half of our South Carolina workers will either be retirement eligible or will actually take retirement over the next 10 years.

We have highly skilled workers, but our operations are supported by documented procedures and extensive training programs. We are more fortunate than some companies in that, even with the retirements, we will retain a lot of institutional knowledge. Nevertheless, we will be dependent upon the local technical colleges to provide us with replacements for the skilled operators, mechanics, welders, line technicians, and electricians we will lose. Those skill levels need to match the complicated work performed in our plants and in the field. We certainly will conduct internal training, but our applicants will need substantial skills to join Duke Energy. Since skilled craft workers are half of our workforce, we will need to see K-12 emphasize STEM education so that the technical colleges can provide us with enough trained people.

We encourage the State to get kids interested in operations and manufacturing and prepared to learn once they get to the technical colleges. We generally find the skilled workers we need, but we do not always do so easily. System operators with engineering backgrounds come to mind as a particularly challenging area. As our current workforce ages, though, we are concerned we may find recruitment of skilled workers more difficult. South Carolina should be ready to meet this need. We have a very positive relationship with South Carolina schools at all levels. We are particularly invested in Clemson’s Center for Workforce Development and its focus on developing a highly competent manufacturing workforce in South Carolina.

We believe the State should focus not only on the educational programs themselves but also on the affordability of those programs. Some investment in the ability of citizens to get the technical training we need from our workforce will pay huge dividends going forward. We encourage people to pursue work keys. Doing so will improve their chances with Duke Energy and similar companies.

As with most worthwhile efforts, funding is the key. Adequately funding the technical colleges system should be a priority. Identifying the programs and skills that industry needs should be step one, and then funding decisions can follow.
Among our Hartsville-based hourly employees, 25% are over 55, and 13% are 60 or older. We are going to lose some valuable, skilled people due to retirement over the next few years. The workforce today is obviously being asked to do more than in the past, and the skill sets required are higher as well. Computers are controlling more of our equipment and operations, and adjustments to manufacturing equipment are being done electronically versus manually. Computer skills are particularly important. Much of what we do in Hartsville involves operating paper machines in our paper mills, and that’s obviously a sophisticated process. It takes time to learn how to operate the machinery.

Our line managers track the age and capabilities of our workforce. This process enables us to identify individuals who will be able to move up into those positions once someone retires. As for recruiting from the outside, we have been able to hire the workforce we need, but we go through a lot of candidates before we find the ones we want.

We use work keys to assess the skill sets of the individuals we recruit; this is administered through Florence-Darlington Tech. Doing so helps us assess the basic math and reading skills of applicants. Work keys assures us that candidates have these fundamental skills, and that they have the capability of learning our processes.

South Carolina needs to build on the success we’ve had training workforces over the years. The training needs to be broken down by skills that are going to be directly applicable to various manufacturing operations regardless of their processes. For example, looking at maintenance positions — the electro/mechanical and problem solving skills that are required for keeping machinery running on a regular basis are substantial. They are also transferable.

A person could work for Sonoco or Boeing or Milliken, because the skills are generic enough to so that they can be taken anywhere. Training of these skills would be beneficial. Also training of generic skills such as quality system skills, safety training, analytical skills — programs that can administer those kinds of skill training could add a level of adaptability to applications that could have some real value today and many years down the road. Ensuring that the technical college system can produce folks with these skills that are linked to business’s needs should be a priority for the State.

“South Carolina needs to build on the success we’ve had training workforces over the years. The training needs to be broken down by skills that are going to be directly applicable to various manufacturing operations regardless of their processes.

- Kenneth Mason, HRVP, North America
Timken faces a similar challenge to the one faced by other manufacturers. 40% of our current workforce is eligible for retirement over the next 5 years (50% in the skilled trade jobs). We see a limited talent pool for skilled trades, so we will have challenges recruiting. That problem may result in us having to establish our own apprentice program (partnering with technical colleges). Training and development of replacement operatives will be a challenge. Our manufacturing processes would be similar to other manufacturers, nothing significantly unique. Our (skilled trade) challenges are centered around dealing with electronic obsolescence and ongoing upgrades. We need skilled people to meet these challenges.

What’s unique and rarely discussed about a global company such as ours, is that one of our biggest competitors is another plant within our company – whether that be a domestic or international location. The product is going to get built, that is a certainty. We (South Carolina Timken) can compete and make the products our customers demand – but without a qualified skilled workforce that can perform at the level we need, we could potentially lose business to other Timken facilities.

The State needs to act, but we will not wait for it to meet our needs exclusively. We are considering an apprenticeship program, continuing with education reimbursement, and continuing to improve our internal training and development programs for all occupations. The recession - and the uncertainty it engendered - caused our company and other manufacturers to take something of a step back in workforce development. As conditions improve, we have to move quickly to make up for lost ground. Folks who delayed retirements are now leaving the workplace, and we will need to fill those slots. Our need for trained workers will be significant, particularly as the economy improves and uncertainty ebbs.

For its part, South Carolina needs to emphasize STEM, MSSC, Work Ready Communities and work keys, and we should increase technical college funding. The focus should be on existing manufacturers – not just those that are new to the State or that are expanding. Increase training for incumbent workers just as we do for the unemployed/underemployed. That way, we keep their skills current and their plants competitive. Also, better focus on technical education in the K-12 area would help as would working to diminish the remedial work technical colleges have to do with kids just to get them ready for the training. In Cherokee County, we have launched a “Know2” effort which Timken fully supports, and expect the State to continue their support.

Our relationship with Spartanburg Community College is very positive. They are customer-focused, and they deliver the training we need in a very professional and competent manner. Manufacturing training is not cheap, though. The funding stream must be there for the technical college system to continue the good work they have done for us and others. At the same time, better coordination of the State’s workforce development efforts is essential. Get everyone on the same page with some consistency. Spend the money wisely.

“40% of our current workforce is eligible for retirement over the next 5 years (50% in the skilled trade jobs). We see a limited talent pool for skilled trades, so we will have challenges recruiting.” - John Milko, Gaffney Plant Manager
AIKEN TECHNICAL COLLEGE
Aiken Technical College is planning to make considerable investments in equipment for its mechatronics, machine tool, welding, and engineering technology programs to remain current with technology used by manufacturers. Graduates from these programs are in significant demand from local manufacturers. Investments for various capital equipment upgrades/purchases are needed in manufacturing related programs.

CENTRAL CAROLINA TECHNICAL COLLEGE
Central Carolina Technical College’s growing industrial technology division requires immediate attention towards faculty. The growing demand from regional manufacturers for a skilled pipeline of students hinges on the College’s ability to attract and retain quality facility members. Equipment upgrades within the welding and mechatronics departments will ensure students have the most up-to-date training experience.

DENMARK TECHNICAL COLLEGE
Denmark Technical College will invest in state-of-the-art equipment to enhance its advanced welding, Mechatronics, and CNC programs. These upgrades are needed to support high tech manufacturers as they request job skills training for their workforce.

FLORENCE-DARLINGTON TECHNICAL COLLEGE
In the Florence-Darlington Technical College service area, thirty-two percent of regional manufacturers report moderate to severe shortages in technically-skilled workers. To address this shortage, the College strives to keep up with technological advancements within the industry. Investments in technology are essential in the electronic engineering, civil engineering, machine tool, and various STEM-based fields in order to provide training at the skill levels needed by manufacturers.

GREENVILLE TECHNICAL COLLEGE
Greenville Technical College projects over the next 3-5 years, a significant need for equipment upgrades in order to stay current with advanced manufacturing training and to meet the volume of students interested in pursuing particular fields. Training is increasing focusing on more automated processes through simulations in the labs – to ensure faculty is prepared to teach the latest processes, professional development programs that provide real-world experience with local manufacturers will compliment in-classroom work.

HORRY GEORGETOWN TECHNICAL COLLEGE
Horry Georgetown Technical College has seen an increase in regional manufacturers’ needs for creating a pipeline of students prepared careers in the sector. The College needs to build and equip a 30,000 square foot facility that would be used to train manufacturing related faculty who would teach machine tool and advanced welding skills.

MIDLANDS TECHNICAL COLLEGE
The greatest challenge for Midlands Technical College is building the student pipeline. This requires strategic marketing and advertising, along with funding necessary for many to participate in manufacturing related programs that will allow students to gain skills and quickly enter the workforce. Investments are needed to help fund manufacturing-related pipeline programs, recruit, retain faculty, and upgrade essential equipment and technology.

NORTHEASTERN TECHNICAL COLLEGE
Northeastern Technical College’s three county service areas have seen recent significant investments from the manufacturing industry that has created new jobs and the need for additional training programs. The College has initiated two new training centers, one at the Pageland Campus and at Bennettsville, to meet the needs of local industry. Having invested approximately $200,000 already in equipment upgrades for training purposes, the College will need to make additional investments to meet the immediate and short-term needs of the industry.

ORANGEBURG CALHOUN TECHNICAL COLLEGE
Orangeburg Calhoun Technical College has invested almost $500,000 in their industrial programs over the last two years in equipment and infrastructure. The most present equipment upgrade demands fall in the fields of CNC operations and robotic welding.
PIEDMONT TECHNICAL COLLEGE
Piedmont Technical College has recently opened and equipped a manufacturing center (Center for Advanced Manufacturing, CAM) in Laurens County. In response to growing manufacturing needs and specific training requests, this campus mainly focuses on Mechatronics and Quick Skills programs. The College is adding a new certificate this fall in Metrology for advanced training for the current workforce in that region. By January 2014, they plan to renovate the remaining space and provide welding and machine tool programs. By Fall 2014, Piedmont will be adding Mechatronics to its Newberry campus. All of this equipment will need to be purchased.

SPARTANBURG COMMUNITY COLLEGE
Spartanburg Community College's most immediate concern, related to the manufacturing industry, is funding for full-time instructors and to reduce the dependency on adjunct faculty who are not able to provide extra services such as assisting with job placement and advisement for students. Upgrades to lab space, equipment (such as mechatronics, CNC, and machine tool), and course guides will ensure the College's manufacturing constituency has the pipeline of skilled applicants needed to meet the demands of the job.

TECHNICAL COLLEGE OF THE LOWCOUNTRY
Technical College of the Lowcountry has made strides in providing current, relevant instruction in introductory levels of CNC and industrial maintenance, industrial electronics, and welding. The College needs additional equipment to enhance the instrumentation necessary to provide more advanced instruction in precision machining and additional equipment to provide instruction in advanced automation.

TRI-COUNTY TECHNICAL COLLEGE
Tri-County Technical College has a steady demand of equipment refreshment because the College’s service area of manufacturers expects that graduates will be able to “hit the ground running” with their equipment and not need upgrading time they walk in the door. In particular, upgrades to CNC and robotics equipment. Additionally, the College needs to refresh virtually all electronic training tools and equipment on a 3-5 year cycle to keep up to date with manufacturing requirements.

TRIDENT TECHNICAL COLLEGE
Trident Technical College's three county service area has experienced significant growth in investment and job creation within the manufacturing sector, especially within the aerospace industry. To keep up with the demands of industry, upgrades and new equipment in the industrial maintenance, machine tooling, aircraft manufacturing and maintenance technology, and avionics are essential training experiences.

WILLIAMSBURG TECHNICAL COLLEGE
Williamsburg Technical College is reinstating a program in the mechanical and electrical field due to popular demand from local industry. Due to the fact the program has been dormant, equipment upgrades, and qualified faculty is essential for ensuring students receive the proper training.

YORK TECHNICAL COLLEGE
York Technical College’s manufacturing education and training capabilities hinge on the College’s ability to employ faculty that is well-trained on the latest technology and equipment, and the for the college to provide students with a real world training experience. Upgrading and replacing existing equipment, such as welding machines, CNC mills, lathes, etc., are top priorities for ensuring the pipeline of students entering the manufacturing field have the necessary skills to meet the industry’s job requirements.
To address manufacturers’ workforce needs, the State of South Carolina must adopt a long-term strategy that ensures technical workforce development initiatives are effective and properly funded. It is not the objective of this whitepaper to make specific funding recommendations, but instead to provide industry leaders’ testimonies and economic activity to showcase the urgency for cultivating a strong technical workforce. Below are specific areas we recommend the State of South Carolina prioritize each year:

- Funding the South Carolina Technical College System in a sustainable manner that meets equipment priorities and ensures that tuition is affordable.
- Support the Manufacturing Skills Standard Council (MSSC) certificate’s future initiatives.
- Promotion of advanced manufacturing careers to students through Dream It Do It South Carolina.
- Support the SC Work Ready Communities program’s future initiatives.
- Encourage and fund Career and Technology Centers throughout South Carolina.
- Make STEM education a long-term State priority.

Additional information about each item is available in the following section.
A HISTORY OF SOUTH CAROLINA TECHNICAL COLLEGE FUNDING

The SC Technical College System’s per FTE (State Funds and Tuition) is less today than the per FTE funding in 1999-2000. Additional resources are necessary for the System to sustain tuition at a manageable level and to continue our focus on educating a workforce which is leading to an average of 80% job placement rate in manufacturing related fields.

It is our recommendation that the FTE funding be increased in a sustainable manner to meet manufacturing equipment needs of the Technical Colleges.

WORKFORCE DEVELOPMENT STANDARDS

MANUFACTURING SKILLS STANDARDS COUNCIL

Manufacturers identify the Manufacturing Skills Standards Council (MSSC) certificate as the best common certification for beginning-level employees. The MSSC certificate is based upon industry-defined and federally-endorsed national standards and offers both entry-level and incumbent workers the opportunity to demonstrate that they have acquired the skills increasingly needed in the technology-intensive jobs. The South Carolina General Assembly funded MSSC in 2013 so that program could be offered statewide. It is our recommendation that MSSC continue to be funding in a sustainable manner as needed.

The Technical Colleges would use the funding as follows:

• Purchasing equipment and other materials necessary to provide MSSC training. Funds may also be used to ensure the proper credentialing and certifying of instructors, and, if available, assist applicants who cannot afford the program.

• Recruitment and outreach to employers and potential employees - including high school students - will be made aware of the demand for, and benefits of, advanced manufacturing careers. The National Association of Manufacturing’s Dream It, Do It campaign will be funded from the appropriation.
DREAM IT DO IT SOUTH CAROLINA

Dream It Do It South Carolina is a collaborative effort among several workforce development partners to communicate the growing importance of advanced manufacturing careers. Created by the National Association of Manufacturers (NAM), Dream It Do It provides a market tested platform to promote manufacturing as a top tier career choice.

The three main objectives of the campaign are:
1. Engage industry leaders and educators to help students, parents, teachers and counselors better understand today’s sophisticated manufacturing industry.
2. Educate more students in advanced manufacturing-related programs in South Carolina’s high schools, two-year colleges and universities.
3. Employ more graduates of advanced manufacturing programs in South Carolina businesses.

Using available funds, The SC Technical College system should integrate Dream It Do It into statewide marketing pertaining to manufacturing programs.

SC WORK READY COMMUNITIES

A Work Ready Community is a measure of the quality of a county’s workforce. It is an assurance to business and industry that the community is committed to providing the highly skilled workforce. South Carolina was chosen to be one of four initial states in the country to implement the Certified Work Ready Communities (CWRC) program. All 46 counties are participating in the Work Ready Communities program. A Certified Work Ready Community means your local county has job candidates in the pipeline with high-demand skills proved by the National Career Readiness Certificate. It also shows that local employers care about hiring the best and brightest your region has to offer. South Carolina’s initiative certifies the quality of the workforce based on 4 criteria. Counties must meet goals for high school graduation, soft skills development, business support, and National Career Readiness Certificate holders.

The main value for businesses regarding this program is the Work Keys Test that is administered at various technical colleges and employment service centers across the state. It is our recommendation that funding for those tests continue at a rate that meets the needs of employers.

CAREER AND TECHNOLOGY EDUCATION (CATE) CENTERS

Encourage and Fund Career and Technology Education Centers throughout South Carolina.

Over the past several decades, South Carolina has worked diligently to prepare its citizens for 4-year college opportunities. For many students, that path makes sense. For others, perhaps an equal, if not greater amount, a 4-year degree is not the best way forward to a rewarding and well-paying career. This state must recognize that there are, in many cases, far better opportunities for our students and that we have an obligation to prepare them for those career paths. We cannot wait for kids to reach college age before we are providing them with the educational opportunities needed to take advantage of current and future manufacturing jobs. Fortunately, school districts across the State are embracing the concept of Career and Technology Education centers (CATE). Educators such as Superintendent Dr. Stephen Hefner in Lexington-Richland School District 5 understand that a 4-year college track is not appropriate for everyone and, in many instances, will not lead to the highest possible wages and benefits.

As an example, the LR5 website provides the following information about its CATE Center which was just completed in late 2012: The Center for Advanced Technical Studies provides students the opportunity to remain enrolled in their high school and take their major course of study at the Center by attending in the morning or afternoon. The design of the programs will enable students to be innovative
learners and problem solvers of the future. Students will complete high quality senior projects, and the learning environment will provide both teachers and students the opportunity to use their imagination, creation, and innovation to develop potential solutions to problems in health care, energy, animal science, aerospace, film production, building industry, manufacturing, and other areas of study. Students will become the critical thinkers and problem solvers of the future.

Teachers will be facilitators of learning, guiding students to learn through discovery. Science theories and concepts will be experienced in contextualized learning environments through student-based projects. Students will use math and science to solve real world problems and create solutions beyond the normal science lab and classroom.

Students will have the opportunity to create ownership of their learning through projects they develop. The curriculum will provide students opportunities to learn the use of nanotechnology in the treatment of cancer cells, learn how to convert agriculture products into energy. Other students will produce movie films, construct and wire smart homes, learn to weld, and repair and maintain the latest automobiles.

The Center will provide students a different way to learn. Students who enjoy applying what they learn to solve real-world problems will find the Center an exciting place to experience education. Think 21st century shop class – only so much more.

**The training required for today’s manufacturing jobs is as advanced as the products. It is challenging and difficult, and we cannot assume that, with no preparation, our children will be ready for technical college training. Equally important, we need to develop their interest in these potentially lucrative career opportunities. CATE centers provide the readiness opportunities needed to develop a 21st century workforce.**

**SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS PROGRAMS (STEM)**

We believe strongly in STEM education, and we have one basic challenge for South Carolina’s public policymakers. Pay close attention to where the manufacturing community puts its own money, and we encourage you to follow suit. In partnership with local education authorities, manufacturers across South Carolina routinely invest hundreds of thousands of dollars in STEM education. They have done so, because they understand the need for STEM education and the benefit it can have to South Carolina’s future. Consider these facts as compiled by Tom Peters, Executive Director of South Carolina’s Coalition for Science and Mathematics:

- Over the past 10 years, growth in STEM jobs was three times as fast as growth in non-STEM jobs.
- STEM workers are less likely to experience joblessness than their non-STEM counterparts.
- Science, technology, engineering and mathematics workers play a key role in the sustained growth and stability of the U.S. economy, and are a critical component to helping the U.S. win the future.
- STEM occupations are projected to grow by 17 percent from 2008 to 2018, compared to 9.8 percent growth for non-STEM occupations.
- STEM workers command higher wages, earning 26 percent more than their non-STEM counterparts.
- More than two-thirds of STEM workers have at least a college degree, compared to less than one-third of non-STEM workers.
- STEM degree holders enjoy higher earnings, regardless of whether they work in STEM or non-STEM occupations.

*The case for adequate STEM education is clear and is recognized at the highest levels by both private and public sector officials.*

“While only four percent of the nation’s work force is composed of scientists and engineers, this group disproportionately creates jobs for
the other 96 percent.” National Science Board. Science and Engineering Indicators 2010. Arlington, VA: National Science Foundation (NSB 10-01)

“A STEM-educated workforce is vital to the security and the prosperity of the U.S. as industry and government increasingly demand highly trained STEM professionals to compete in the global market.” The Heritage Foundation

“When BMW looked for workers 10 years ago they sought a specific skill set. Today’s BMW’s recruiters are looking for a completely different employee — robotics engineers, people with computer skills, productivity, problem-solving, creativity.” Jim Reynolds, the 2011-2012 Chairman of the South Carolina Chamber of Commerce, in a speech given August 8, 2011 entitled, “Strategies to Prepare South Carolina’s Knowledge Workforce.” Source for quotes: Tom Peters, Executive Director of SCCSM

South Carolina must continue to develop its STEM education initiatives through the following means:
1. Adequately fund STEM initiatives.
2. Ensure continuity, consistency, and efficacy of STEM across the State.
3. Encourage private investment in STEM initiatives.
4. Encourage uniformity in curriculum.
CONCLUDING REMARKS

South Carolina is already home to some of the top manufacturing companies in the world. South Carolina’s port system facilitates waterborne commerce, while interstate networks throughout the I-85, I-95, I-20, and I-26 corridors serve as commerce rich highways that provide manufacturers with easy access interstate commerce.

It is clear that in the coming years, there will be an influx in the number of manufacturers taking an interest in South Carolina. These manufacturers will need qualified workers who have the technical training and soft skills required to serve in these jobs. The technical college system’s role in South Carolina’s manufacturing renaissance will be more important than ever. It will be critical that we provide a pipeline of students who are well trained and motivated to contribute to this growing manufacturing workforce.

In order for our technical college system to be successful in preparing the coming generation of industry workers for upcoming manufacturing needs, policymakers will need to stand behind appropriations for equipment upgrades and training. If South Carolina technical students are not given the tools necessary to qualify for the imminent abundance of manufacturing jobs, those jobs will become more costly to businesses that will be forced to undertake expensive recruitment of out of state workers. To be successful in attracting good jobs for South Carolinians, we have to commit to the strengthening of our workforce development efforts. South Carolina’s participation in the re-shoring of manufacturing jobs to the United States is absolutely dependent on the availability of a skilled workforce.

For South Carolina to benefit fully from the re-shoring of manufacturing jobs to the US, policymakers must ensure South Carolina has a large and skilled workforce, or those jobs will go to other states where workers are plentiful.