



Advanced Manufacturing  
in New England

# Strategies

for Tapping the Potential

**In  
the  
1800s,**

when a fledgling United States was beginning to gain its global identity as an economic powerhouse, there was little question as to what was driving that distinction. The New England region was the economic engine of the country, and the exponentially expanding need for manufactured goods fueled that engine. The demand for shoes, textiles, and other mass-produced goods seemed endless, and the manufacturing industry in New England flourished.

by James Brett  
and Mike Reopel

Nothing is constant, times change. Even though the high-yield manufacturing industry has shown longevity, very few people believe that the future of manufacturing in New England lies in producing low-tech goods in high volumes. Traditional manufacturing has been on the decline for years, and to remain competitive, a strategic approach is necessary, one that capitalizes on New England's strengths. A mix of highly skilled and educated workers, engineers, business developers, and financiers makes the region uniquely suited to excel in advanced manufacturing.<sup>1</sup>

## A Position of Strength

Advanced manufacturing is characterized by innovative approaches that create complex products and devices with a high standard of operational excellence. Rather than profitability derived from the sheer number of goods produced, advanced manufacturing relies on technical expertise for profit, with production volumes typically quite low when compared with standard manufacturing.

Important to New England's efforts to foster a strong economic outlook, the advanced-manufacturing sector offers not only highly skilled jobs but also well-paying ones. In turn, these jobs in specialized industries strengthen the overall economy and create new employment opportunities across a whole range of social strata.

In New England, it is estimated that nearly 60 percent of manufacturing jobs can be classified as advanced manufacturing, meaning that advanced manufacturing has now outpaced its traditional counterpart. Among the companies that host the jobs are the multinational Raytheon, headquartered in Waltham, Massachusetts. Others are smaller, emerging companies, such as Insight Tech-Gear, which is headquartered in Londonderry, New Hampshire, and is a leading supplier of optical instruments to the military. Between the scope and size of these two businesses lie hundreds of similar companies that contribute mightily to the New England economy.

Perhaps more than any other area in the country, New England has an infrastructure rich in knowledge and talent. Few regions can come close to the depth or diversity. Advanced manufacturing thrives in a network, or "talent cluster," consisting of scientists, researchers, precision machinists, engineers, business developers, and entrepreneurs. That kind of atmosphere results in enhanced innovation and problem solving and reduces learning curves that might otherwise impact the profitability of what is relatively low-volume production. Specific areas ripe with these concentrated talent clusters include Merrimac Valley (Massachusetts)/Southern New Hampshire; the section stretching from New London, Connecticut, to New Bedford, Massachusetts; and the Connecticut River Valley.

Advanced manufacturing relies on a tight learning curve, innovation, and the ability of information and expertise to flow freely among stakeholders. Talent clusters and the centralized expertise in New England enhance that learning curve and

capitalize on economies of scale. By collaborating in a network to design the prototype to a lower cost, the innovation clusters also can help solve the "first unit" problem (manufacturing cost is highest for the production of the first unit). Large volumes would not be needed for the product to become cost-competitive because the starting point would be more competitive. Essentially,

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joint problem solving and shared efficiencies allow advanced-manufacturing players to do less and profit more.

A recent study commissioned by the New England Council and conducted by Deloitte Consulting LLP, provided strategies for growth within New England's advanced-manufacturing sector. And it projected that, if a concerted effort to promote and support the sector were made, approximately 8,000 new jobs with average salaries of \$80,000 could be created in the region each year.

## Challenges

Five major factors have so far kept the advanced-manufacturing industry in New England from reaching its potential.

First, according to the study, is skill level. Many advanced manufacturers report difficulties filling well-paying jobs because of the lack of a qualified and skilled labor force. In fact, the researchers found that approximately 3,000 to 4,000 advanced-manufacturing positions in New England were left unfilled in recent years. Residents' need for employment is there. What is lacking is, in part, the training and tracking of the workforce into these high-paying jobs.

To an unfortunate degree, the shortage of skilled labor in the advanced-manufacturing industry stems from perception. When people hear the word "manufacturing," many immediately think of the "Four Ds"—dirty, dark, dangerous, and declining. Parents and teachers tend not to advocate careers in manufacturing. They fail to emphasize how a solid backing in mathematics and applied sciences can give students a leading edge for the high-paying jobs in advanced manufacturing. Also, most schools do not prioritize hands-on learning, and that reduces opportunities for workforce development in the sector.

Second, advanced manufacturers themselves do not collaborate enough to develop their employment base. They need to partner more extensively with schools to do a



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better job of moving students into dynamic manufacturing careers. Hosting educational site visits and participating more in career seminars would go a long way toward rebranding advanced manufacturing as a vibrant industry with good, challenging jobs. The effort to track students into these jobs will not bear fruit overnight. A shift in mind-set has to come first.

Third, state governments are failing to make even relatively modest investments to spur the advanced-manufacturing sector. Many state manufacturing tax incentives were created in the 1950s and have not kept up with the times. A concerted effort is needed to determine best practices, help leverage targeted financial assistance from the federal government, and identify which tax policies will allow advanced manufacturing to create and retain high-quality jobs.

Fourth, loans can be hard to get for businesses trying to expand. Advanced manufacturers, particularly smaller ones, are often hampered by limited access to capital. Sector-specific small business loan programs could help advanced manufacturers reach their full potential on a faster track, creating job opportunities in a still-struggling economy.

Finally, cross-border collaboration needs strengthening. New England state governments need to do more to work together across state lines. They should have their economic development departments create an inventory of advanced manufacturers to facilitate partnership-building efforts throughout the region. The New England states need to start viewing their neighbors as manufacturing partners, not as competitors. Individual states will be stronger as part of a clearly identified, collaborative, advanced-manufacturing region than if they go it alone.

## A Shared Solution

At a time when many people take a cautious, and sometimes even cynical, view of targeted government investment, the New England Council/Deloitte report is unique in its holistic recommendations. It advocates for involving numerous stakeholders, not just the public sector. A comprehensive solution requires the private sector to undertake proactive educational outreach, an investment of time and resources, and rebranding. Selected tax incentives and a relatively modest loan program are only one part of a larger effort to create a substantial

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infusion of jobs—advanced-manufacturing jobs and others—into the economy. To the report’s authors, that is the essence of “smart government”—a strategic investment in an underutilized industry of high potential and collaboration with the private sector to leverage the greatest number of jobs possible.

In the new economic reality, New England must take a thoughtful and calculated inventory of assets—educational, financial, engineering, and knowledge-based assets—and leverage those assets to achieve a strategic objective. The New England Council plans to continue its work with elected officials and leaders in the

advanced-manufacturing industry throughout the region to capitalize on some of the untapped potential in the industry and to advance the shared goal of job creation.

New England must not only protect its base when it comes to advanced manufacturing, but it also must take steps to ensure the industry’s enhancement and long-term health. The high-paying regional jobs at stake—both existing and potential—speak to the importance of a concerted effort to ensure that the full viability of the sector can be achieved.

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### Endnote

<sup>1</sup> This article is based on the 2009 study, “Reexamining advanced manufacturing in a networked world: Prospects for a resurgence in New England,” <http://www.newenglandcouncil.com/reports.php>.