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Advanced Manufacturing Creates the Products and Processes of Tomorrow

by Jason Timian, Labor Market Analyst

LMDR Labor Market & Demographic Research

The term "advanced manufacturing" is often used to describe products or processes that utilize technological advances to enhance the way we make things or the things that we make. Examples of advanced manufacturing products include innovative drugs and chemicals, state-of-the-art electronic components, and groundbreaking surgical and medical devices, among others. The industry is constantly evolving and, as a result, not only requires a well-educated workforce, but also needs workers willing to continue to develop their knowledge base and remain current with changing technology. Advanced manufacturing and its ongoing innovation is vital to New Jersey's continued economic success.

Here are a few key industry facts based on the latest data available:

- In 2009, there were more than 127,000 jobs within industries classified as advanced manufacturing.
- These industries contributed over $17 billion to New Jersey's 2009 Gross Domestic Product, or about 3.6 percent of all output.
- More than $11.6 billion in wages were paid in 2009, or roughly 6.8 percent of New Jersey's total wages paid.

Sector Components

The advanced manufacturing sector primarily consists of four main industry components that make up 81 percent of the employment: chemical manufacturing (45%), computer and electronic product manufacturing (22%), machinery manufacturing (11%), and transportation equipment manufacturing (3%). Industries that are classified outside of these four groups comprise the remaining 19 percent of employment and manufacture products considered advanced or that use advanced technological procedures to produce their goods.

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Employment

Of the roughly 265,000 manufacturing jobs in New Jersey in 2009, more than 127,000 were in industries classified as advanced, or about 48 percent. Using the same data at the national level, only 42 percent of all manufacturing jobs can be considered as advanced.

Manufacturing jobs have been on the decline at both the state and national level for a number of reasons. Since 1990, New Jersey's manufacturing employment base has been nearly halved, losing more than 263,000 jobs. The manufacturing sector share of total employment in New Jersey has declined from 14.6 percent in 1990 to 6.8 percent in 2009 (nationally, manufacturing employment has fallen from 16.2 percent to 9.1 percent). These losses (at a rate of 3.6% annually) have offset gains (0.8% annually) in all other

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industries for a total growth rate of 0.4 percent in New Jersey.

Recent data show that advanced manufacturing industries have fared better than their non-advanced counterparts. From 2004 through 2009, overall losses have averaged 4.6 percent per year for all New Jersey manufacturing companies. Employment among advanced manufacturing industries averaged only a 3.8 percent annual decline while non-advanced companies averaged a 5.2 percent decline. The same data shows a similar, yet slightly less pronounced, trend at the national level.

Top Industries

Chemical manufacturing is the leading employer among the advanced manufacturing industries in New Jersey with 2009 employment exceeding 57,000 workers. In fact, New Jersey employs the third most workers in chemical manufacturing in the nation behind only California and Texas. These workers make up more than seven percent of all chemical manufacturing employment in the nation.

Chemical manufacturing is the leading employer among the advanced manufacturing industries in New Jersey with 2009 employment exceeding 57,000 workers.

Pharmaceutical and medicine manufacturing is the largest subset of chemical manufacturing, accounting for nearly three-of-every-five jobs. Although New Jersey can no longer be dubbed the undisputed “Medicine Chest of the World”, ranking second behind industry leader California in 2009 employment, its nearly 34,000 workers accounts for 12 percent of national chemical manufacturing employment.

Computer and electronic product manufacturing is the second largest industry in the advanced manufacturing cluster. There are nearly 28,000 New Jersey workers that develop products such as navigational systems, communications equipment, and other electronic components to be used on military and commercial platforms. Some of the largest defense contractors in the world have operations in New Jersey to take advantage of its unique advantages such as its highly skilled workforce and robust transportation network.

Average Wages by Industry

As one might expect, the jobs requiring advanced skills and abilities also

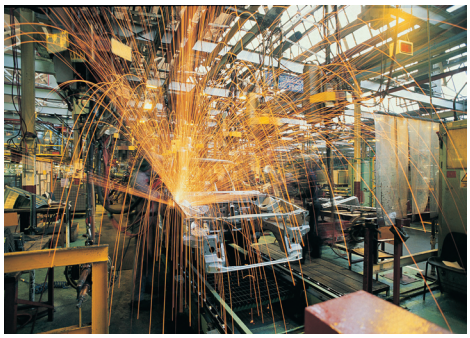
New Jersey’s Advanced Manufacturing Cluster (2009)

Industry Components	Employment	Establishments	Average Annual Wage ($)
Advanced Manufacturing Cluster	127,116	3,439	91,472
Chemical Manufacturing	57,384	921	112,839
Computer and Electronic Product Manufacturing	27,897	756	80,131
Machinery Manufacturing	14,230	843	63,912
Transportation Equpiment Manufacturing	4,265	160	52,962
All Other Advanced Manufacturing	23,367	759	76,321
Private Sector Employment, NJ Total	**3,158,235**	**259,906**	**54,543**

Source: NJ Dept of Labor and Workforce Development, Quarterly Census of Employment and Wages, 2009 Annual Average

warrant higher wages. In 2009, average wages in New Jersey in advanced manufacturing industries were about 73 percent more than in non-advanced manufacturing industries.

Average wages are also growing faster for advanced manufacturing workers than their counterparts from 2004-2009. An annual increase of 4.4 percent for advanced manufacturing wages in New Jersey outpaced both its non-advanced counterpart (+2.5%), and national comparison (+2.9%). These average wages are also increasing faster than all New Jersey industries, which grew by 3.8 percent.



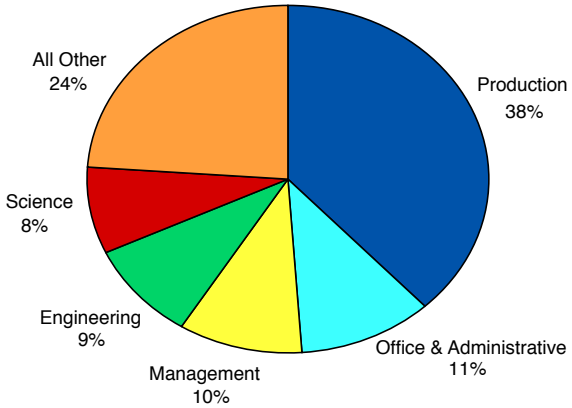
A closer look at the components that make up the advanced manufacturing cluster shows that chemical manufacturing workers were the highest paid, on average, in 2009 at $112,800. Their earnings also grew the fastest among the components from 2004-2009, adding nearly $26,000 or 5.4 percent per year. Computer and electronic product manufacturing was the second-highest-paid industry in 2009 with $80,100 in average wages. Machinery manufacturing averaged $63,900 in wages. Only transportation equipment manufacturing ($53,000) earned average wages less than the state average of $54,500.

Occupational Breakdown

The occupational breakdown of the workers employed by advanced manufacturing firms in New Jersey is shown below. Nearly two-out-of-five workers were directly involved with the production functions (e. g. machine operators or tenders). Currently available data shows that these workers tended to have lesser responsibilities and lower educational requirements for entry into employment. Empirical evidence, however, shows that the job-skill specifications and educational requirements now are increasing rapidly as technology improves. As this transition from "button pushers" toward computer assisted controls continues to evolve, educational and training requirements, and thus wages, will increase accordingly.

The remaining 60 percent of the advanced manufacturing workforce in New Jersey is spread across several major occupational groups. The management, engineering and science groups typically represent highly paid workers who hold at least a bachelor's degree. In total, roughly one-third of all workers in the advanced manufacturing sector hold at least an associate's degree while most possess a bachelor's degree or higher.

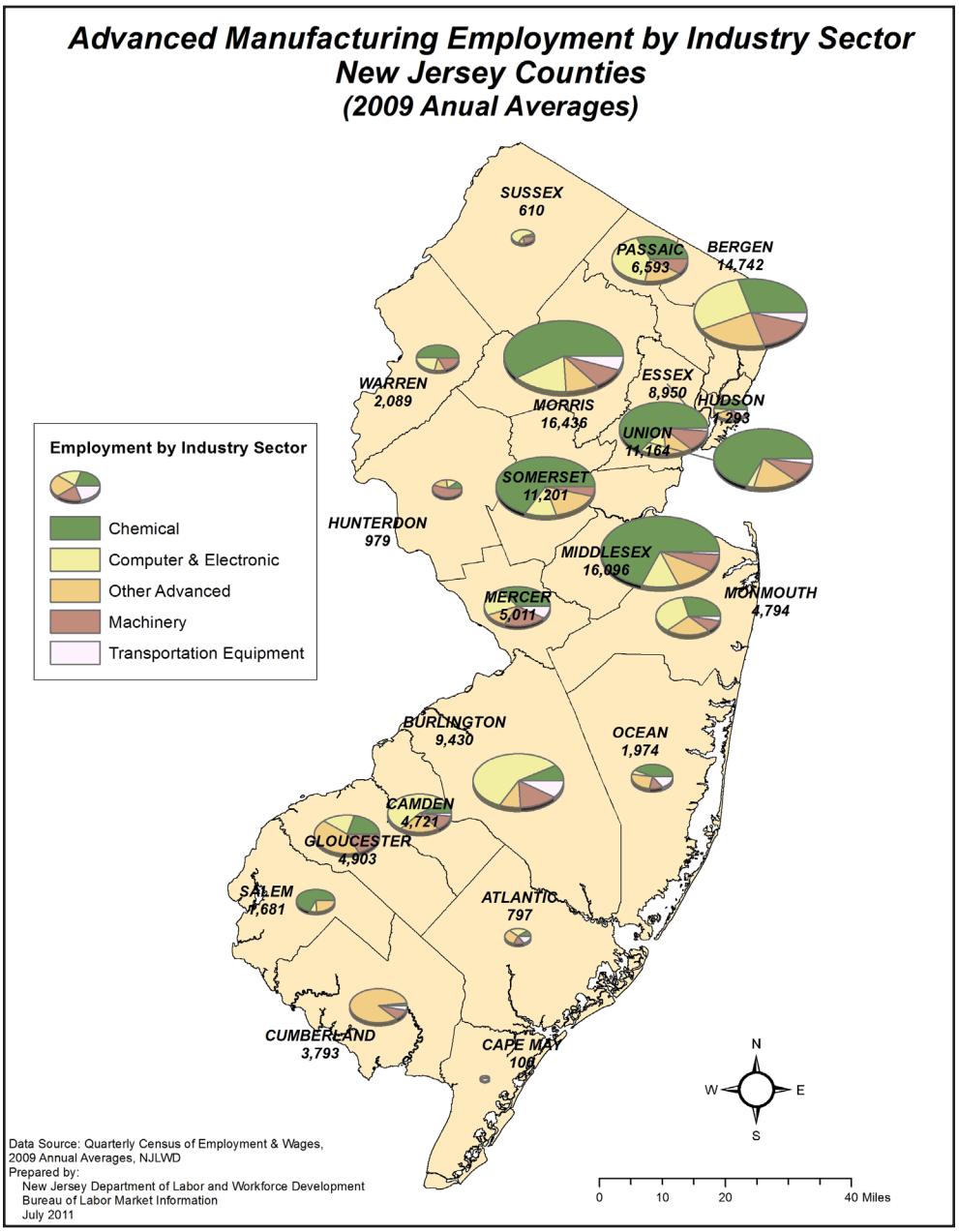
Breakdown of Occupational Groups within Advanced Manufacturing: New Jersey, 2009



Projections/Outlook

The outlook is mixed for the future of advanced manufacturing in New Jersey. Total employment is projected to continue its long-term trend of decline, however at a slower pace. Advanced manufacturing industries are projected to decline at a rate of 1.9 percent through 2018. This pace is better than the 2.6 percent annual decline projected for those manufacturing industries not classified as advanced.

Presently the transformation of manufacturing in New Jersey, and the nation, is well underway and its trajectory will only intensify. As time goes on, more companies in different types of industries will apply advanced techniques to their production methods. It is essential that current and future workers continue to enhance their skills to keep up with this trend. For New Jersey, it is crucial that we continue to be a leader among states in training and education to ensure that the future of advanced manufacturing develops in the Garden State.



For information regarding Labor Market Views please contact JoAnne Caramelo by phone at (609)292-2582 or by email at joanne.caramelo@dol.state.nj.us. To subscribe, email njsdc@dol.state.nj.us with Labor Market Views in the subject line.