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MANUFACTURING

cluster workforce analysis

PURE MICHIGAN®
Workforce Development Agency

January 2013

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Workforce Development Agency

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Dear Colleagues:

Thank you for your interest in Michigan's workforce development industry clusters. The vitality of our state's priority industry clusters – Agriculture, Energy, Health Care, Information Technology, and Manufacturing – are essential components of a thriving economy. There is growing evidence that industry clusters are an effective organizing framework for positively impacting economic and workforce development activities. It is critical that we examine these clusters to understand job opportunities, industry talent needs, as well as workforce supply; and the Workforce Development Agency, in partnership with the Office of Labor Market Information and Strategic Initiatives is pleased to make this resource available.

This industry cluster briefing analyzes several labor market measures including employment concentration, trends, and forecasts; key occupations; education program completers; and workforce demographics. It is an additional tool to assist in the implementation of the Michigan Industry Cluster Approach (MICA). MICA focuses on aligning efforts – initiatives, programs, and funding – around priority clusters for a demand-driven workforce system. This approach, led by the Workforce Development Agency is being implemented in partnership with employers, the Michigan Works! System, the Michigan Economic Development Corporation and local economic development entities, education and training providers, and statewide trade associations. A key activity of MICA is the convening of groups of employers to identify and develop solutions to address workforce needs.

We hope that you find this information valuable. It should provide a road map that leads to stronger partnerships and a more effective workforce development system. Please contact us if you have questions about this analysis, or would like more information about the Michigan Industry Cluster Approach.

Respectfully,

Christine Quinn, Director
Workforce Development Agency

Michigan's Manufacturing Cluster Workforce: KEY FINDINGS

- Manufacturing remains vital to the Michigan economy despite significant levels of job loss in recent years. The cluster employs over half a million workers statewide, nearly one out of every six private sector jobs.
- According to the Bureau of Economic Analysis, manufacturing has the largest multiplier effect of any industry, generating $1.40 of additional output from other industries for every dollar of final product created in the cluster. In addition, studies cite that from four to six indirect jobs in other industries are created for each new manufacturing job added.
- With 18 percent ($61 billion dollars) of total statewide GDP, manufacturing ranked first among Michigan industry clusters in 2011. Adjusted for inflation, manufacturing GDP statewide grew by 9 percent from 2010 to 2011, three times the growth rate of total private GDP.

Manufacturing is in Michigan's DNA and is the very foundation of our state's economy. Our industrial sector is not only alive and well in Michigan, it is here to stay.

—Chuck Hadden
President and CEO
Michigan Manufacturing Association

- Jobs in manufacturing pay extremely well compared to the other industries statewide. Michigan manufacturing workers made $1,132 per week on average, 37 percent more than the total private average in 2011. The cluster accounted for over 21 percent of total private wages paid in the second quarter of 2011.
- Manufacturing in Michigan is characterized by the prevalence of domestic automakers, yet it remains a diverse cluster spread across a number of specific sub-sectors and hundreds of individual, specialized industries. For example, *Food manufacturing* and *Furniture manufacturing* on the state's west side enjoy a strong competitive advantage nationally, much like the auto industry's dominance in Southeast and Mid-Michigan.
- Despite well-publicized job losses in manufacturing in recent times, the cluster is expected to offer a large number of annual openings across a variety of low, mid and high skilled jobs over both the short and long run. Current data indicates strong short-term demand for workers in production, management, and engineering jobs with the highest-paying opportunities going to those jobseekers with specialized skill sets and educational and training backgrounds.

CLUSTER HIGHLIGHTS

	MANUFACTURING CLUSTER	TOTAL, ALL INDUSTRIES
Employment	507,000	3,270,400
Short Term Job Change (2009 to 2011)	+11.0%	+3.2%
Long Term Job Change (2005 to 2011)	-25.6%	-11.2%
Gross Domestic Product (2011, current $)	61.0 billion	339.5 billion
Long Term Average Annual Openings	12,200	135,900
Percent of Workers over 55 years old	19.9%	18.4%
Percent of Workers who are Female	26.5%	49.2%
Total Wages Paid (2nd Quarter 2011)	$7.5 billion	$35.1 billion
Average Weekly Wage	$1,132	$827
Change in Average Weekly Wage (2005 to 2011)	+7.2%	+8.2%
Online Job Vacancies	6,800	132,000
Educational Program Completers	7,000	282,800
Workers with Associate's Degree	33%	33%
Workers with Bachelor's Degree	24%	27%

Source: Bureau of Labor Market Information & Strategic Initiatives

Michigan's MANUFACTURING CLUSTER IS DIVERSE

The Manufacturing cluster is a vital part of Michigan's economy and economic history and future, providing over half of a million jobs in 2011. While automotive and related production is the key driver of the state's Manufacturing cluster, the state employs a number of workers in the creation of a diverse set of product types outside of motor vehicles. The cluster contains over 80 distinct industries categorized into 10 separate sub-clusters, with an additional *All other* sub-cluster capturing manufacturing industries outside of the specified groups listed below.

507,000
CLUSTER JOBS

chart 1:
Manufacturing Cluster Employment by Sub-sector

27% Automotive Manufacturing

18% Metals Manufacturing

13% All Other Manufacturing

AUTOMOTIVE MANUFACTURING
(137,500 Jobs) – Supports the entire production process of motor vehicle manufacturing. Includes motor vehicle, motor vehicle body and trailer and motor vehicle parts manufacturing.

METALS MANUFACTURING
(91,400 Jobs) – Smelt or refine metals or shape forms of metals in basic compounds. Includes steel mills, structural metals, coating and heat treating and machine shops.

MACHINERY MANUFACTURING
(60,000 Jobs) – Pertains to the design, production and assembly of equipment used across many industries. Includes HVAC, engine and transmission and metalworking equipment.

FOOD AND BEVERAGE MANUFACTURING
(38,300 Jobs) – Primarily deals with the manufacturing of goods for consumption, including the packaging of such goods. Includes animal slaughtering and processing, commercial bakeries and fruit and vegetable canning.

PLASTICS AND RUBBER PRODUCT MANUFACTURING
(32,000 Jobs) – Processing of plastic materials or rubber into goods. Includes industries like plastic automotive parts, plastic bottles and urethane and foam products.

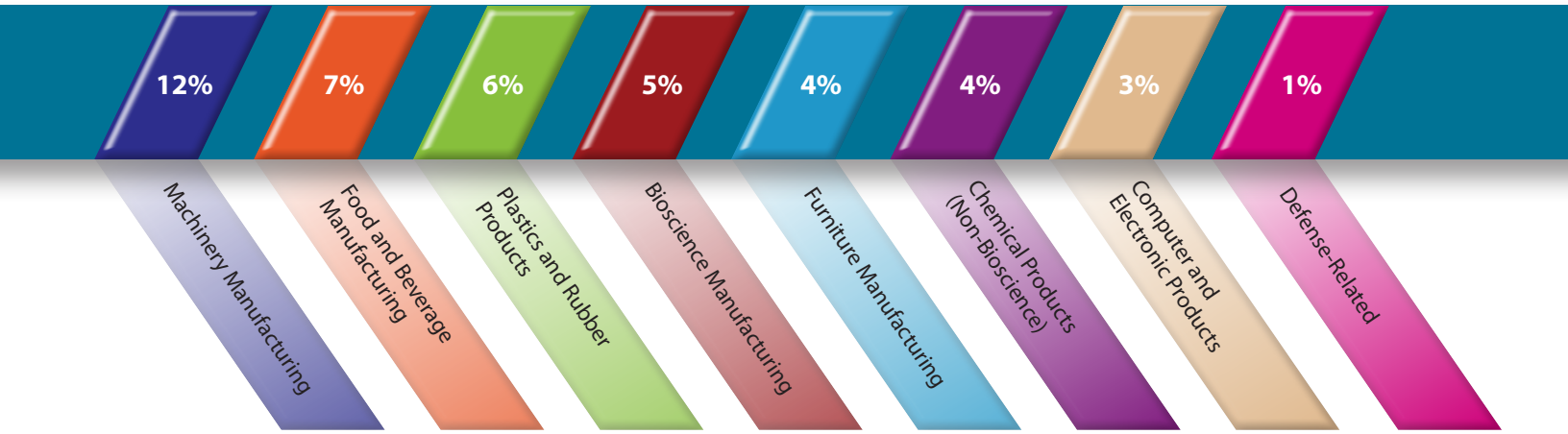
BIOSCIENCE MANUFACTURING
(24,800 Jobs) – Integrates life science with manufacturing. Includes industries such as medical equipment, pharmaceuticals and agricultural chemicals.

FURNITURE MANUFACTURING
(19,200 Jobs) – Production of furniture and related products. Includes household and institutional furniture and kitchen cabinets, office furniture and mattress manufacturing.

CHEMICAL PRODUCTS, NON-BIOSCIENCE
(18,100 Jobs) – The transformation of raw materials through chemical processes. Includes resin and synthetic fibers, soap and cleaning and paint products, coatings and adhesives.

COMPUTER AND ELECTRONIC PRODUCT MANUFACTURING
(13,600 Jobs) – The production of computers and electronic goods. Includes semiconductors, computers and peripherals and communications equipment manufacturing.

DEFENSE-RELATED MANUFACTURING
(5,900 Jobs) – Manufacture of goods related to military activities. Includes aerospace products, navigation and guidance, weapons and military armored vehicles.



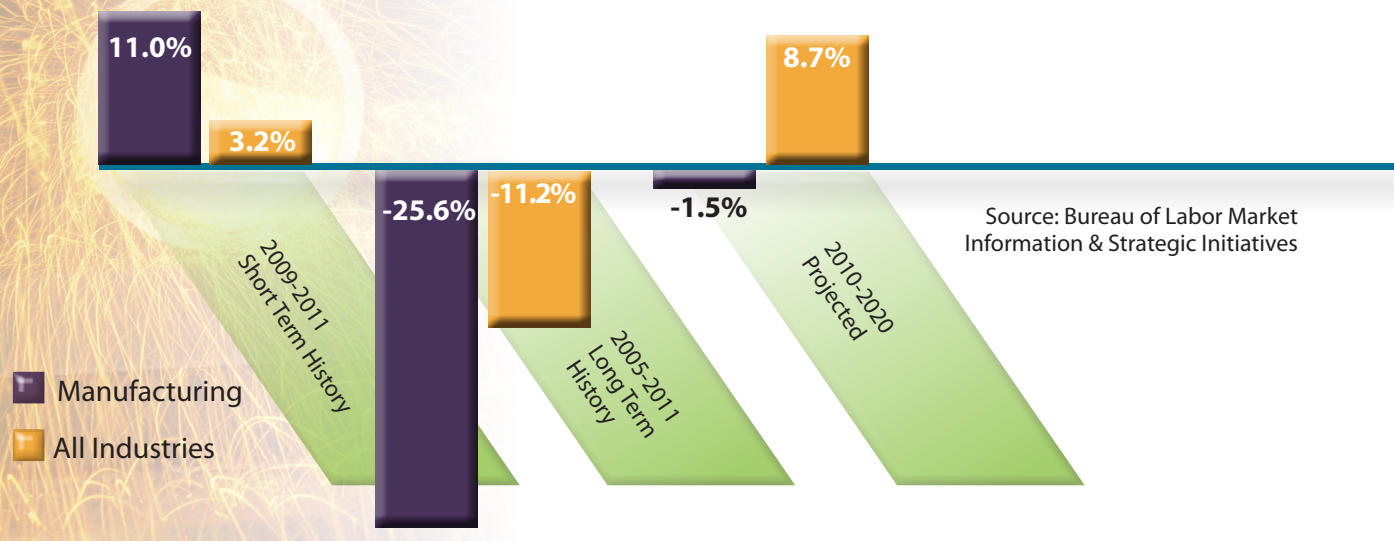
Source: Bureau of Labor Market Information & Strategic Initiatives

RECENT MANUFACTURING JOB GAINS LEAD STATE RECOVERY

Michigan's Manufacturing cluster has a unique and storied history. Most of the state's prosperity in the 20th Century was a direct result of the substantial production capacity of the state's resources and workforce. Countless studies have been done on the economic impact of the state's Manufacturing cluster, particularly in the automotive industry, and have shown that Michigan's Manufacturing cluster generates additional jobs across nearly every other industry sector and region within the state. As a result, the state's economic health has been clearly tied to the fortunes of the Manufacturing cluster and the jobs and wages it creates.

- Despite having lost over 25 percent of jobs in Michigan since 2005, manufacturing remains a major workforce cluster in the state with over half a million jobs. Many of the long-term job reductions were the result of improvements in manufacturing technology and productivity, but the recent national recession and the financial and housing crises that followed also contributed greatly to the loss of over 170,000 jobs since 2005.

chart 2:
Employment Growth Trends



Source: Bureau of Labor Market Information & Strategic Initiatives

- In recent years, manufacturing has begun to bounce back, growing by 11 percent between 2009 and 2011, or almost four times the rate of overall jobs statewide. *Motor vehicle manufacturing* and *Metals manufacturing* were the primary driving forces behind this growth, each accounting for over one-third of the 50,000 jobs added in this period.

- Despite recent job gains, however, technology and other factors are expected to limit the growth of manufacturing jobs in the long run. Manufacturing jobs should edge down slightly between 2010 and 2020, though labor demand will still exist in good numbers as firms look to replace workers lost through retirement and general attrition.

- Michigan's Manufacturing cluster enjoys a strong competitive advantage compared to the U.S. overall, with a location quotient of 1.44 in 2011. In addition, several sub-sectors within the cluster enjoy enormous competitive advantages. While it's no surprise that auto-related industries in Southeast Michigan have large location quotients, *Breakfast cereal* and *Furniture manufacturing* on the west side of the state display strong job concentrations as well.

table 1:

MANUFACTURING RELATED INDUSTRIES WITH LARGEST NUMBER OF JOBS

(2nd Qtr. 2011)

INDUSTRY	MANUFACTURING JOBS
Motor Vehicle Parts Manufacturing	93,131
Motor Vehicle Manufacturing	37,941
Metalworking Machinery Manufacturing	31,697
Plastics Product Manufacturing	27,902
Machine Shops/Turned Product	25,603

Source: Bureau of Labor Market Information & Strategic Initiatives

table 2:

INDUSTRIES WITH ABOVE AVERAGE EMPLOYMENT CONCENTRATION

(2nd Qtr. 2011)

INDUSTRY	LOCATION QUOTIENT
Breakfast Cereal Manufacturing	9.3
Motor Vehicle Manufacturing	7.8
Motor Vehicle Parts Manufacturing	6.9
Metalworking Machinery Manufacturing	6.3
Office Furniture Manufacturing	4.8

Source: Bureau of Labor Market Information & Strategic Initiatives

SECTOR EMPLOYS A WIDE RANGE OF KEY OCCUPATIONS

While Michigan's manufacturers employ workers across a diverse set of occupations, the bulk of employment in the cluster is concentrated in the *Production* occupations group. Even so, professional occupations requiring very specialized education and skills are also vital to the state's manufacturing success, particularly in key sub-sectors like the auto industry, which relies heavily on engineering talent to innovate new products and production processes.

- The *Production* occupations group makes up over half of all manufacturing cluster jobs. While a number of these jobs are medium-skilled, recent trends suggest that companies are requiring more training for workers in these types of occupations as technology and manufacturing processes become more complex.

- One in five manufacturing workers statewide is employed in *Management* or *Professional* occupations. In fact, almost 40 percent of all Michigan engineers are employed by a manufacturing company. These jobs require high levels of education and training and pay comparatively well.

table 3:

KEY OCCUPATIONS IN MANUFACTURING

OCCUPATION	2008 JOBS	JOB OUTLOOK 2013	SHORT TERM ANNUAL OPENINGS	MEDIAN WAGE	MINIMUM TRAINING
PRODUCTION OCCUPATIONS					
CNC Machine Tool Operators	10,580	+6.6%	473	$ 15.98	Short-term OJT
Tool and Die Makers	12,320	+3.0%	227	$ 25.23	Long-term OJT
Molding and Casting Machine Operators	9,160	+3.4%	340	$ 14.22	Moderate OJT
Welders, Cutters and Solderers	6,750	+4.6%	370	$ 16.89	Moderate OJT
Machinists	18,870	+4.5%	811	$ 18.95	Long-term OJT
Mixing and Blending Machine Operators	3,730	+0.3%	118	$ 15.48	Moderate OJT
Team Assemblers	29,460	+2.9%	1,045	$ 14.81	Moderate OJT
Quality Control Inspectors and Techs	14,560	+3.4%	501	$ 16.27	Moderate OJT
Production Supervisors	19,120	+2.0%	389	$ 27.80	Moderate OJT
MANAGEMENT AND PROFESSIONAL					
Industrial Engineers	11,440	+3.3%	440	$ 38.86	Bachelor's
Industrial Engineering Technicians	3,070	+2.7%	120	$ 21.20	Associate's
Industrial Production Managers	6,220	+4.0%	274	$ 47.06	Work experience
Purchasing Agents	4,530	+2.1%	167	$ 28.75	Long-term OJT
Mechanical Engineers	8,270	+2.7%	493	$ 40.89	Bachelor's
Engineering Managers	3,710	+2.1%	102	$ 52.75	Bachelor's plus work exp.
OTHER KEY OCCUPATIONS					
Industrial Machinery Mechanics	6,730	+5.6%	346	$ 22.93	Long-term OJT
Industrial Truck and Tractor Operators	9,810	+2.2%	298	$ 15.12	Moderate OJT
Production Planners and Clerks	3,550	+2.0%	111	$ 19.66	Moderate OJT

OJT = On-the-Job Training

Source: Bureau of Labor Market Information & Strategic Initiatives

PRODUCTION, ENGINEERING JOBS PROVIDE SHORT-TERM JOB GAIN

"While entry-level production jobs account for a good portion of total job openings on an annual basis, in manufacturing many of these jobs offer workers above-average pay and benefits and upward growth."

PRODUCTION JOBS PROVIDE OPPORTUNITIES

- Over 95 percent of *CNC operators* in Michigan are found within the Manufacturing cluster. It is also one of the few occupations in the Manufacturing cluster expected to add jobs over both the long and short term, with job expansion expected at 6.6 percent through 2013.
- *Production supervisors, Machinists,* and *Tool and die makers* make up the key production occupations within the cluster with short-term job demand and above-average hourly wages. While educational requirements are not particularly high for these jobs, considerable on-the-job training and work experience are typically necessary for workers.
- *Team assemblers* are an important occupation in manufacturing despite many of these jobs being viewed as entry-level and lower paying than average. It is the only cluster occupation expected to see openings in the short run above 1,000 per year, and accounts for over 5 percent of total manufacturing employment in Michigan. *Team assembler* jobs also open the door for opportunities in other higher-paying and more specialized jobs in the cluster.

ENGINEERING JOBS PAY WELL AND IN DEMAND

- *Mechanical, Industrial,* and *Electrical engineers* and *Engineering technicians* employed in manufacturing are all expected to grow fairly well in the short term. These positions largely require substantial education and pay well above average wages.
- *Engineering managers* will also be in demand in Michigan. Within the industry, jobs like these are sometimes referred to as *Business unit managers* and are vital in executing specialized aspects of a firm's product development and ultimate production.
- Demand for engineering jobs generated by the manufacturing industry is understated by the data here, as many separate engineering consulting firms also pick up work as a result of manufacturing subcontracting.

OTHER MANUFACTURING JOBS ON THE RISE

- Industry experts cite a strong need for jobs outside of *Production* and *Engineering* as well. These include jobs like *Mechanical drafters* and *CAD designers, Machinery mechanics* and *Electronics repairers*. Occupational data confirm the need for these jobs in terms of overall demand and above-average wages.

table 4:

HIGH-DEMAND, HIGH WAGE OCCUPATIONS BY EDUCATION AND TRAINING REQUIREMENTS

BACHELOR'S DEGREE OR HIGHER	ASSOCIATE'S DEGREE OR VOCATIONAL TRAINING	ON-THE-JOB TRAINING
Accountants and Auditors	Electrical and Electronics Repairers	CNC Machine Tool Operators
Commercial and Industrial Designers	Heat Treating Equipment Operators	Electricians
Electrical Engineers	Industrial Engineering Technicians	Engine and Other Machine Assemblers
Engineering Managers	Industrial Machinery Mechanics	Industrial Production Managers
General and Operations Managers	Mechanical Drafters	Machinists
Industrial Engineers	Mechanical Engineering Technicians	Production Supervisors
Mechanical Engineers	Welding and Soldering Machine Operators	Sales Representatives

Source: Bureau of Labor Market Information & Strategic Initiatives

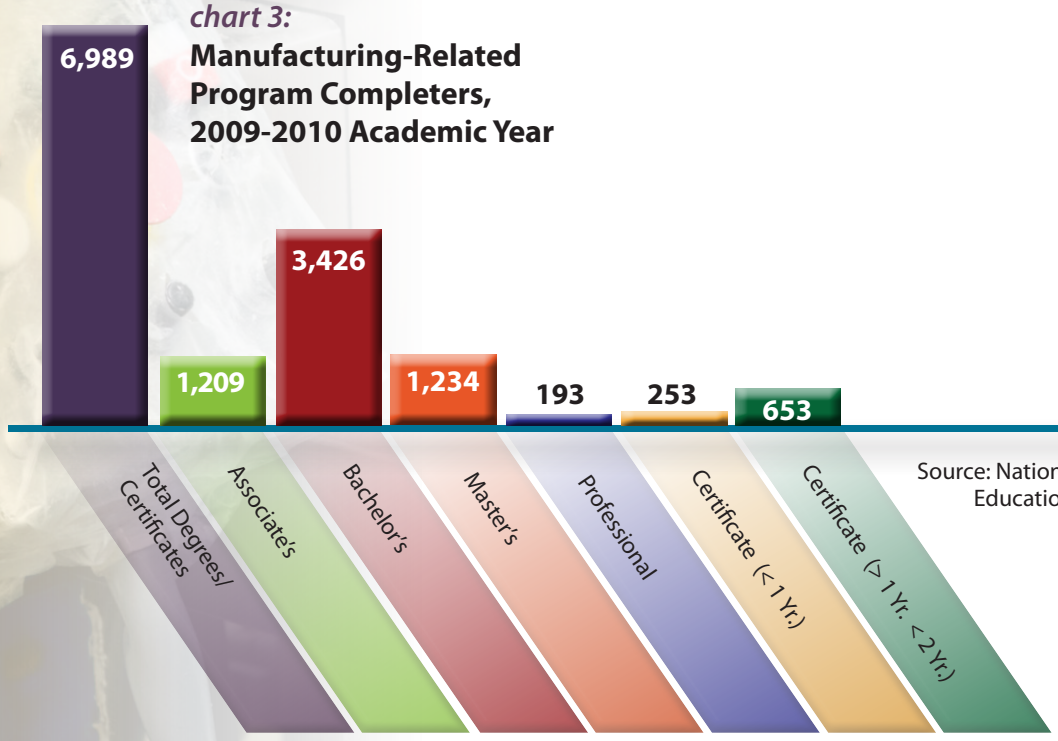
Education Programs:

MOST PROGRAM COMPLETERS ARE BACHELOR'S OR HIGHER

One important way to measure the labor supply in the Manufacturing cluster is to look at the numbers of people completing related programs. According to the National Center for Education Statistics, nearly 7,000 degrees or certificates were granted in manufacturing-related programs in Michigan in 2010.

- The number of program completers in manufacturing-related programs has largely remained stable since the 2005-2006 academic year. The most recent year's figure of 6,989 is similar to the five-year average of 7,022 program completers.
- The bulk of completers in programs related to the cluster were in bachelor's degree programs. These accounted for half of all manufacturing-related degrees awarded in the 2009-10 academic year, with most of these degrees coming in the fields of engineering, drafting and other production-related technology specialties.

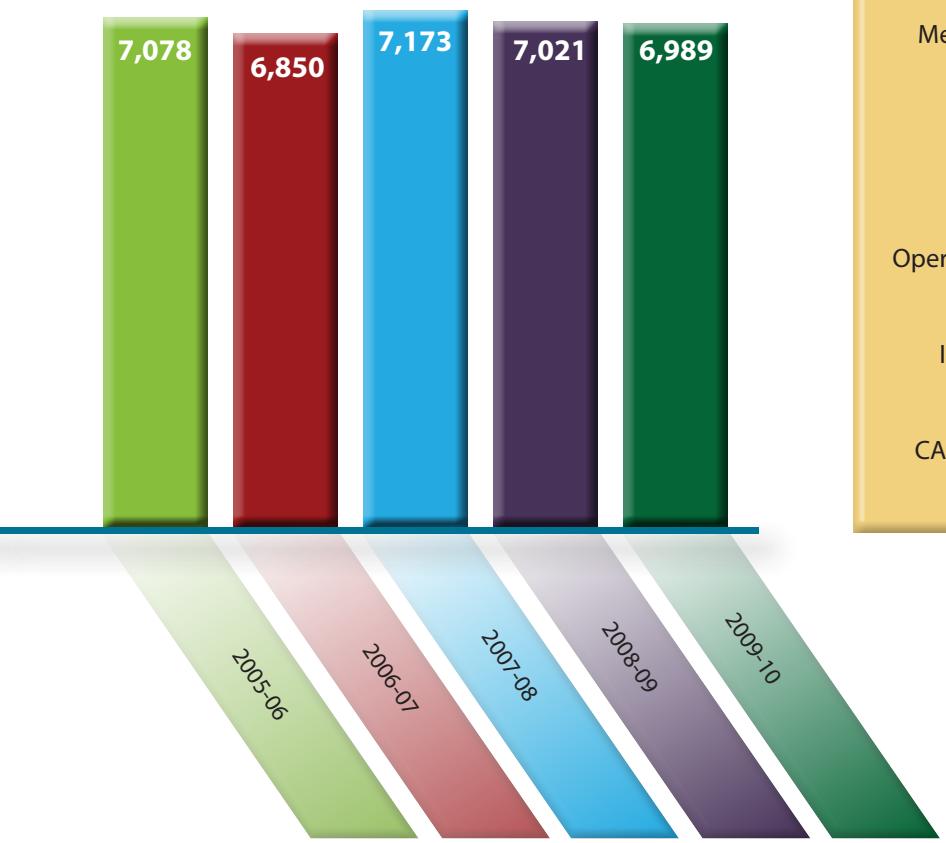
chart 3:
Manufacturing-Related Program Completers, 2009-2010 Academic Year



Source: National Center for Educational Statistics

- Associate's degrees and vocational certificate programs of less than 2 years also made up a notable portion of completers in manufacturing-related fields. Combined, these made up almost one third of the total completers in 2009-10.
- Unlike educational needs in some industries and clusters, manufacturers rely heavily on a white-collar workforce possessing hard math and science skills. Table 5 below provides a sample of some of the larger manufacturing-related programs and regardless of the level of the degree (master's, bachelor's, or associate's), each program is concentrated in math, science and technology.

chart 4:
Manufacturing-Related Program Completers by Year



Source: National Center for Educational Statistics

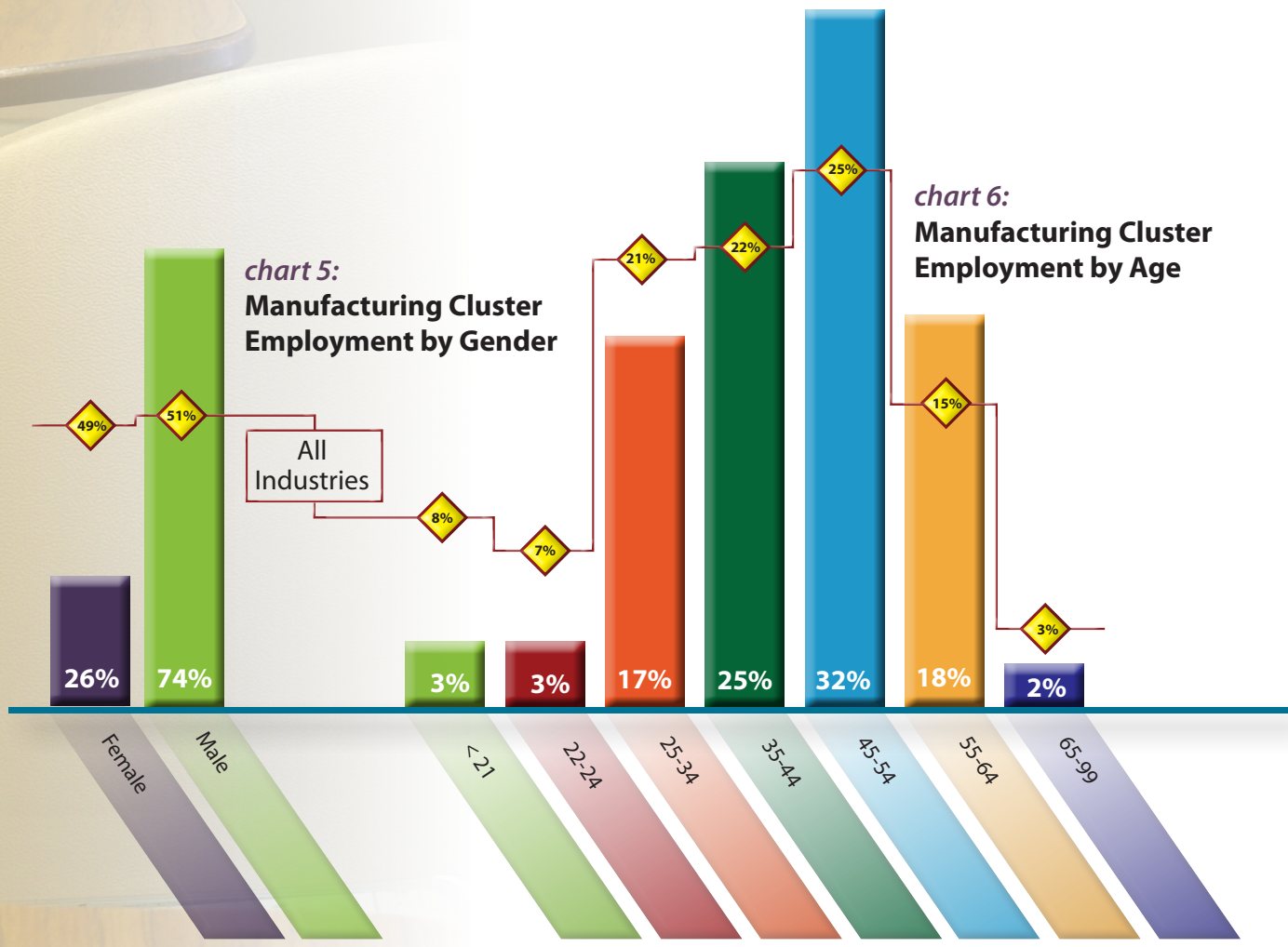
table 5:

MAJOR MANUFACTURING RELATED PROGRAMS
Mechanical Engineering (bachelor's and master's) 1,500 Completers 2009-10
Electrical and Electronics Engineering (bachelor's and master's) 755 Completers 2009-10
Operations Management and Supervision (bachelor's) 288 Completers 2009-10
Industrial Production Technology (associate's) 242 Completers 2009-10
CAD/CADD Drafting and Design Tech. (associate's) 233 Completers 2009-10

Source: National Center for Educational Statistics

AGING OF MANUFACTURING WORKFORCE REMAINS A CONCERN

Workforce demographics are useful in identifying the characteristics of the local talent pool and evaluating potential future issues such as the aging workforce and skills and training disparities. These types of issues left unidentified and unresolved can lead to real impediments to economic growth, as companies struggle to replace aging workers or keep up with worker skills in an ever-evolving global business environment. The following charts offer a glimpse at the gender, age and education demographics of the current manufacturing workforce in Michigan compared to the average across all industries.



Source: U.S. Census Bureau, Local Employment Household Dynamics

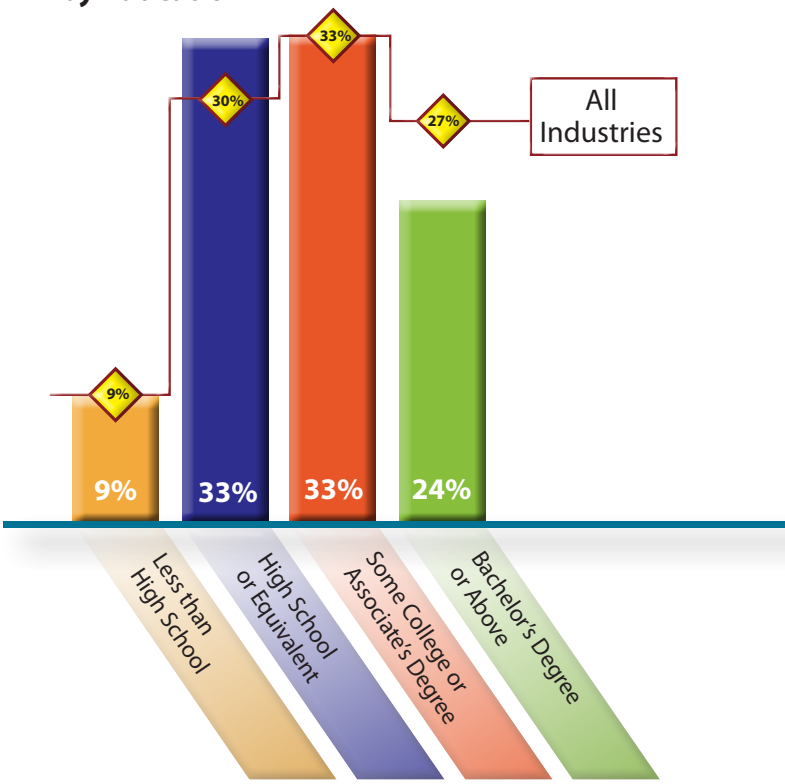
- While total jobs across all industries are split nearly equally between men and women, males tend to outnumber females in the Manufacturing cluster by a ratio of 3 to 1. Three out of every four jobs in the cluster were held by men in 2011, numbering over 378,000 in the cluster compared to 136,000 women.

- Although shares of manufacturing workers over 55 years of age are only slightly higher than average, workforce aging issues remain a concern in Michigan's Manufacturing cluster. As Chart 6 illustrates, shares of workers in three age groups above age 35 are higher than the average for all industries in Michigan, while manufacturing lags the state in the share of younger age workers. Over three of every four workers (or 77 percent) in manufacturing were over 35 in 2011 compared to 65 percent across all industries.

- While the aging issue in manufacturing has yet to be fully realized, firms will be reliant on younger workers to replace workers lost due to retirements, particularly if recent population out-migration patterns in Michigan do not moderate in the near future. Only 23 percent of manufacturing workers were under age 35 in 2011, compared to 35 percent of workers across all Michigan industries.

- Though the manufacturing workforce has been labeled in the past as ranking low in terms of education and training, the reality is that the education profile of Michigan manufacturing workers is similar to the broader economy. The only slight differences exist in the proportion of workers with a bachelor's degree or higher (24 percent), compared to 27 percent across all industries. As a result, the cluster has a 3 percent higher share of workers with only a high school diploma or equivalent.

chart 7:
Manufacturing Cluster Employment by Education

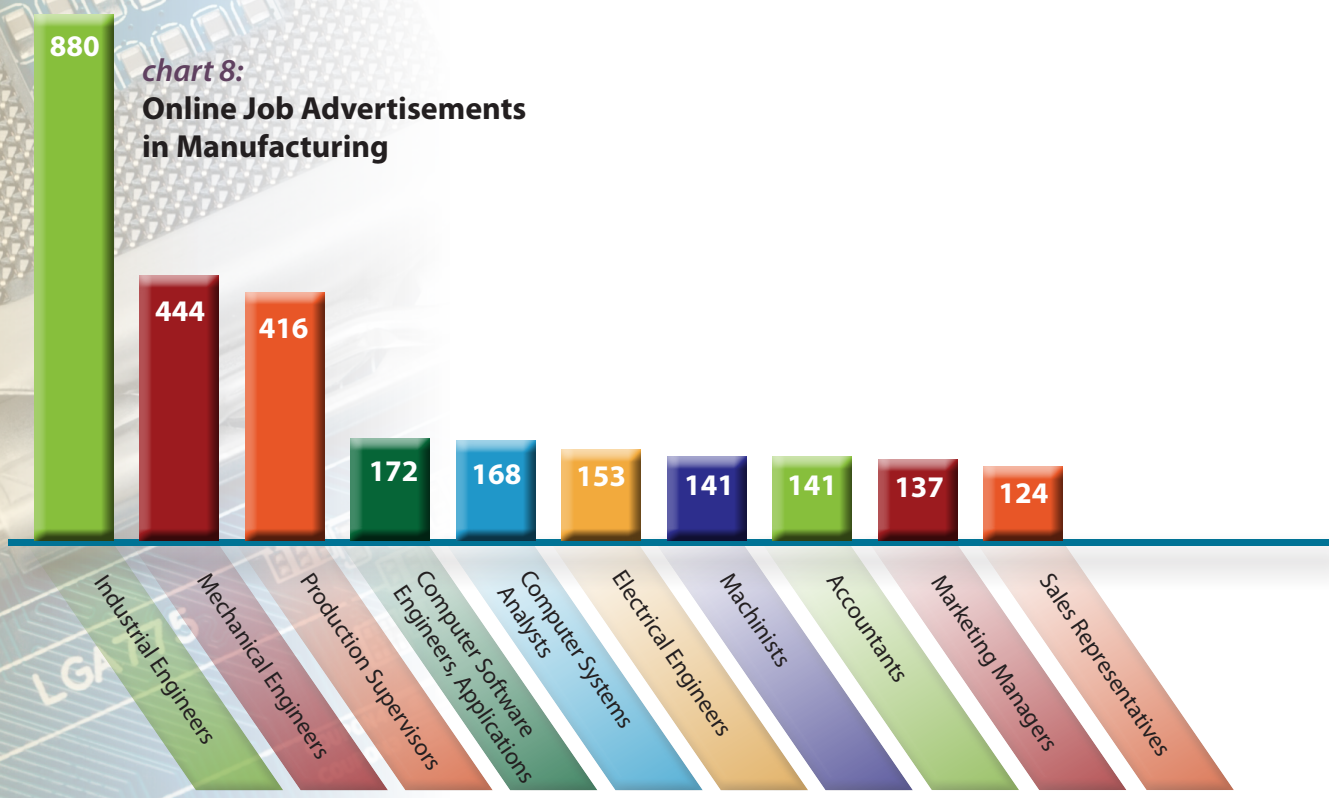


Source: U.S. Census Bureau, Local Employment Household Dynamics

ENGINEERING JOBS AMONG THOSE IN DEMAND NOW

Real time job demand is a key piece of information that offers insight not otherwise available from workforce information sources. These data allow workforce developers, educators and businesses to quantify current online job demand for occupations across a number of regions and industries. The number of advertisements refers to the number of actual online postings made by companies in search of workers for a given period. Jobs that are "difficult to fill," such as those listed in Table 6, represent postings that are more than 90 days old, and may indicate shortages or skills mismatches between available jobseekers and the expectations of employers.

chart 8:
Online Job Advertisements in Manufacturing



Source: Conference Board, Help Wanted Online® (HWOL)

- In the second quarter of 2012, there were 6,911 total online job postings in manufacturing-related occupations, which represented essentially no change compared to the second quarter of 2011's total of 7,075.
- Despite showing little change in the number of advertisements over the year overall, a new trend has emerged since the third quarter of 2011, when only 4,155 such postings were listed online. Every month since then has reported a steady increase in manufacturing-related job ads, pushing the total up 63 percent overall in those seven months.
- At the top of the list of occupations with the most online advertisements are *Industrial* and *Mechanical engineers*. These two occupations combined account for one out of every five job postings in the Manufacturing cluster. These occupations are also high paying, high skill and difficult to fill for employers.
- Employers are currently looking for both skills in specific technologies such as *CNC operation* and *AutoCAD*, though broader knowledge in the areas of project management and product development and design are also in demand.

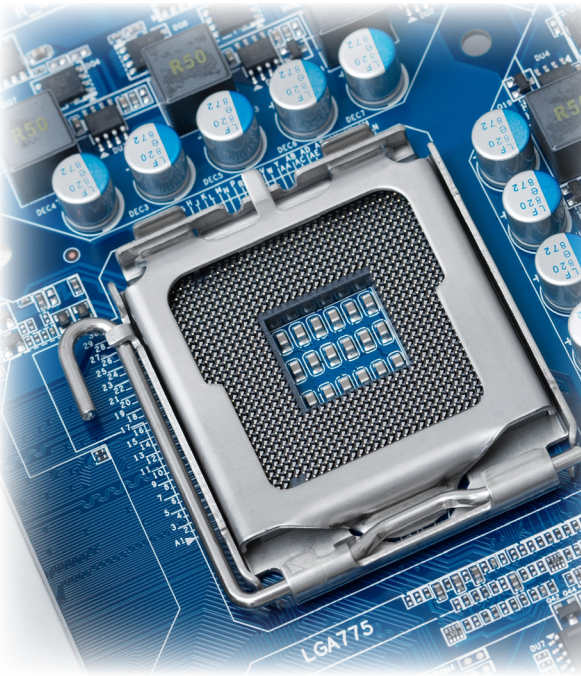


table 6:

DIFFICULT TO FILL JOB VACANCIES
Industrial Engineers
Mechanical Engineers
Electrical Engineers
Computer Systems Analysts
First Line Supervisors of Production and Operating Workers

table 7:

OCCUPATIONS WITH GROWING ONLINE VACANCIES
Mechanical Engineers
Production and Planning Clerks
Electrical Engineers
Laborers and Material Movers
Treasurers and Controllers

table 8:

KEY SKILLS EMPLOYERS ARE SEEKING
Project Management
Product Development/Design
AutoCAD
CNC Machine
Process Controls

Source: Conference Board, Help Wanted Online® (HWOL)

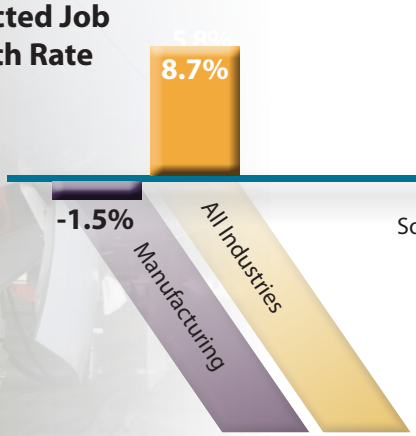
LONG-TERM JOB OUTLOOK LIMITED BUT ANNUAL SKILLED JOB OPENINGS EXPECTED

Long-term industry and occupational forecasts suggest that manufacturing jobs will remain relatively stable through 2020, as technological advancements and production efficiency along with other factors continue to restrict demand for labor in the sector over the long run.

Jobs in the Manufacturing cluster are expected to edge down by less than 2 percent through 2020. This represents a loss of about 7,000 jobs statewide during this period overall. However, in terms of replacement positions as workers retire or otherwise leave the sector, the cluster will still generate substantial job demand in Michigan.

Despite the slight loss of base jobs overall, occupational data for manufacturing suggest that the cluster is expected to fill over 12,000 openings on an annual basis statewide when replacement openings are factored in.

chart 9:
Projected Job Growth Rate



Source: Bureau of Labor Market Information & Strategic Initiatives

SHORT-TERM OUTLOOK IN SECTOR IS ROBUST

Production jobs, which make up 53 percent of the Manufacturing cluster, are expected to advance by 6,800 within the cluster between 2011 and 2013. When replacement positions are factored in, Michigan manufacturers are expected to provide over 8,800 annual job openings in this occupational group. The major broad occupations within the cluster (Chart 10) are each expected to grow faster than the average across all occupations and industries through 2013.

- *Metals and plastic workers* are expected to grow by 3.8 percent through 2013. This group will account for over 3,700 manufacturing openings annually with *Machinists* and *CNC operators* accounting for almost one-third of these opportunities.
- *Team assembler* positions are forecast to rise by 2.9 percent in the short run and contribute over 1,000 of manufacturing's 2,200 annual openings in the *Assemblers and fabricators* group.
- *Engineers* within the Manufacturing cluster will add over 800 new jobs during this period of time while providing almost 1,200 openings annually when replacement opportunities are factored in. *Engineers* directly employed in manufacturing account for 40 percent of all engineers statewide.
- *Material moving workers* will provide over 1,100 openings annually within the cluster during this period and make up a notable portion of overall demand outside of production workers and engineers.

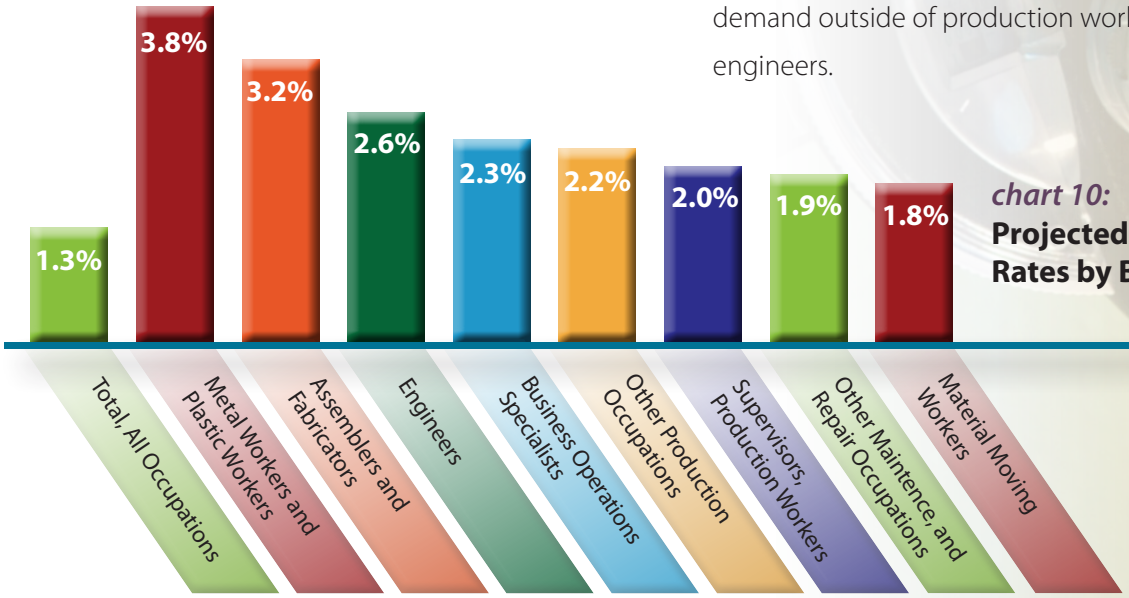


chart 10:
Projected Short-Term Growth Rates by Broad Occupation

Source: Bureau of Labor Market Information and Strategic Initiatives
Chart data reflects occupational growth rates across all industries, not just manufacturing.

Conclusion:

ADVANTAGES AND KEY CHALLENGES GOING FORWARD

Manufacturing practitioners need to become life-long learners if they are to stay on top of technology advances. Manufacturing jobs are not the repetitive-assembly jobs of the past. From CNC operators to engineers, today's manufacturing jobs require technical, communication and problem-solving skills, and industry and education must work together to prepare both our current and future workforce.

— Mark Tomlinson, CEO
Society of Manufacturing Engineers

Despite having shed jobs overall in the past decade, Michigan's Manufacturing cluster remains a catalyst for statewide economic growth, just as it had for most of the prior century. Domestic automakers that call Michigan home have provided and continue to provide numerous job opportunities for individuals with the right skills. A good portion of these jobs offer above-average wages and benefits which promote growth across other industries in terms of indirect jobs. Not all of these positions are for *Production* workers on an assembly line either, as technological advancements in *Production* and design continue to drive demand for white-collar jobs like *Engineers*, *Drafters*, and *Technicians*.

The Manufacturing cluster is faced with its share of challenges going forward, however. Workforce aging issues, increased consumer demand for foreign-built products and an ever-increasing need for skilled workers threaten the long-term outlook for an industry that still accounts for almost one-fifth of Michigan's private sector income overall. Cooperation and collaboration among the state's manufacturing businesses, educators and economic and workforce developers will be needed to address the cluster's current and future workforce issues.

ADVANTAGES

LARGE SECTOR AND ECONOMIC DRIVER

Manufacturing remains among the largest provider of jobs in Michigan in spite of highly-publicized job losses in recent years. Over half of a million of the state's 3.2 million private-sector jobs were provided directly by manufacturing in 2011, while a number of jobs across other industries are also reliant on manufacturing business and wages.

CUTTING EDGE TECHNOLOGY AND SCIENCE

Michigan's manufacturing businesses remain at the forefront of technological advancements in production and design technologies globally, especially among automotive producers. Southeast Michigan continues to be a draw for automotive engineering talent while the state boasts some of the most sophisticated production plants and processes worldwide.

GOOD-PAYING AND DIVERSE RANGE OF JOB OPPORTUNITIES

While entry-level *Production* jobs account for a good portion of total job openings on an annual basis, in manufacturing many of these jobs offer workers above-average pay and benefits and upward growth. Plenty of opportunities exist in *Engineering, Logistics, Accounting,* and *Computers* for those with an interest in pursuing post-secondary degrees or training. Manufacturing is an ideal industry for workers who enjoy problem-solving and seeing real, concrete results in the workplace.

CHALLENGES

LOOMING WORKER REPLACEMENT ISSUES

While workforce aging issues are not specific to manufacturing, they are very real to businesses in the cluster. As the economy rebounds and excess labor supply begins to dry up, businesses will need to use creative strategies to attract skilled younger workers to replace their experienced incumbent workforce. Though the cluster's share of workers 55 and older is similar to the all industry average, it has a notably higher share of 35-54 year old workers and a lower proportion in the under age 35 category.

LONG-TERM NEW JOB GROWTH MAY BE LIMITED

Long-term forecasts both statewide and nationally predict that the overall base number of jobs will remain relatively flat in manufacturing. The challenge is increasing awareness of the fact that the industry locally will need many thousands of new workers to replace the existing workforce, since the predicted lack of job expansion tends to discourage younger workers from seeking careers in manufacturing.

LOSS OF TRAINING INFRASTRUCTURE

Loss of training programs have limited the ability of Michigan manufacturers to address short-term skills shortages in some specialized production-related technologies. Coordination between businesses, educators, and workforce developers will be necessary to help alleviate such skills shortages.

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If you found the information in this analysis of value, you may be interested in other cluster-related publications:

Michigan Industry Cluster Approach (MICA) Guidelines
http://web.michworks.org/OWD/index_wp.htm

Labor Supply / Demand and Labor Shed Studies
www.michigan.gov/lmi

The Michigan Department of Technology, Management and Budget, Bureau of Labor Market Information and Strategic Initiatives (LMISI) conducted the research, and compiled and analyzed the information for this report. Other publications authored by LMISI are available at www.michigan.gov/lmi.