November 15, 2010

Engineering Occupations

Michigan and Southeast Michigan are rich in engineering talent. In 2009, Michigan was the top ranked state in the nation in terms of engineers and architects; with almost three percent of all occupations being found in the engineering and architecture fields.

Table 1
Top Five States in Density of Architecture and Engineering Occupations

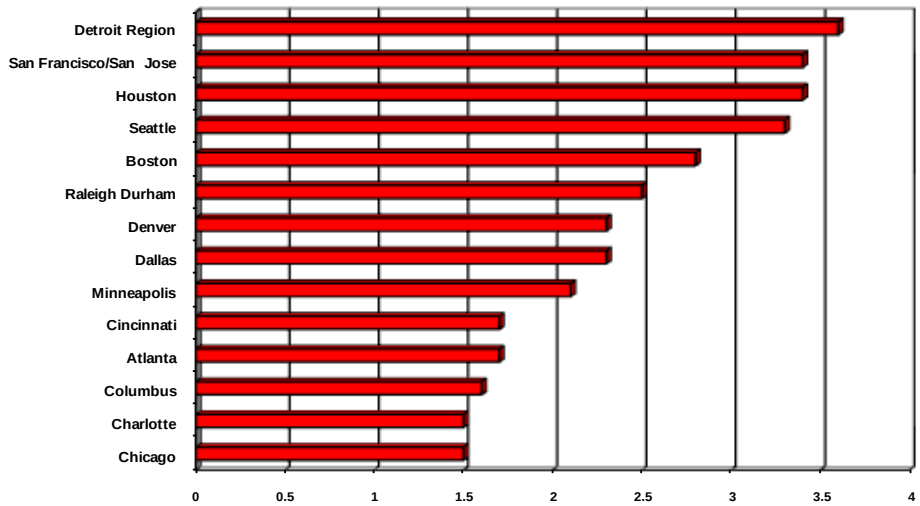
State	Total Occupations	Architecture & Engineering Occupations	Share	Rank
Michigan	3,893,900	113,330	2.91%	1
Washington	2,789,670	79,790	2.86%	2
Alaska	308,140	8,630	2.80%	3
New Mexico	800,390	21,730	2.71%	4
Colorado	2,234,250	56,490	2.53%	5
United States	130,647,610	2,412,730	1.85%	n/a

Source: Bureau of Labor Statistics.

Engineering Capacity in the Detroit Region

In 2009, there were more engineers per workers in the Detroit region than any other metro area in the United States. For every 100 people working, 3.6 were employed as an engineer or architect. There were more than 77,000 people working as engineers in the Detroit region; the largest group is industrial engineers.

Figure 1
Engineers per 100 Workers, Metro Areas 2009



Source: Bureau of Labor Statistics.

The Alternative Energy Economy

Production of alternative, or clean, energy has been identified as an emerging growth industry. Clean energy jobs are those jobs involved in clean energy production, increasing energy efficiency, reducing carbon emissions and other pollution, and conserving our natural resources. According to the Pew Center for the States report entitled *The Clean Energy Economy*, there were more than 770,000 clean energy jobs in the United States as of 2007. Michigan has become a leader in the clean energy economy, ranking 10th among all states in the number of clean energy jobs with 22,674 jobs and the 9th in the number of clean energy businesses with 1,932 businesses, as of 2007. The state's growth rate of 10.7 percent in clean energy jobs from 1998 to 2007 exceeded the national average of 9.1 percent, and considerably outperformed the overall economy in the state, which declined by 3.6 percent during the same time period.

Top Ten States with Clean Energy Jobs, 2007

State	Clean Jobs 2007	Clean Businesses 2007	Clean Job Growth 1998-2007	Overall Job Growth 1998-2007
California	125,390	10,209	7.7%	6.7%
Texas	55,646	4,802	15.5%	6.7%
Pennsylvania	38,763	2,934	-6.2%	-3.1%
Ohio	35,267	2,513	7.3%	-2.2%
New York	34,363	3,323	-1.9%	-2.6%
Florida	31,122	3,831	7.9%	22.4%
Illinois	28,395	2,176	-2.5%	-2.5%
Massachusetts	26,678	1,912	4.3%	-4.4%
New Jersey	25,397	2,031	-9.6%	-2.7%
Michigan	**22,674**	**1,932**	**10.7%**	**-3.6%**
United States	770,385	68,203	9.1%	3.7%

Source: Pew Charitable Trusts, 2009 The Clean Energy Economy report.

Skills for the New Economy

The transition to a new economy requires an emphasis on a different range of skills than we have seen in the past. Occupations related to green design and manufacturing, biology, logistics, and medical services will be among the fastest growing fields in the future. Educating our adult population in these growing fields is the key to a healthy economy in the future.

Michigan post-secondary institutions ranked 15th overall among states in the number of degrees completed per capita in all fields related to green design and manufacturing in 2009. However, the state ranked 3rd in science and engineering degrees (defined as degrees in Chemistry, Engineering, Engineering Technology, and Geology), an important component of green design and manufacturing and one that builds on our historic strength in producing engineering talent. And Michigan ranked 2nd in the number of degrees completed per capita in the emerging logistics field, while also outpacing the national average in degrees awarded in medical services (defined as all medical science, technology, and administration degrees other than actual medical degrees – MDs and DOs).

Degrees Completed Per One Million Adults (Age 18+) in New Economy Related Occupations, by State, 2008-2009

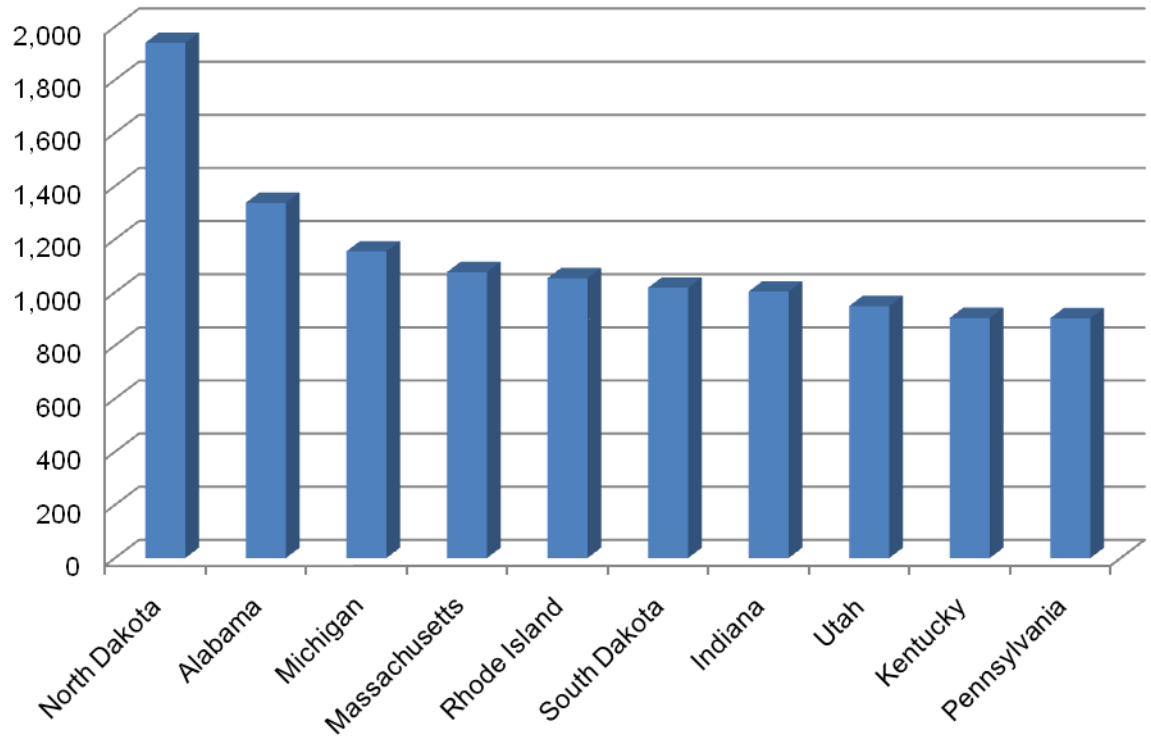
Geographic Area	Alternative Energy and Green Design and Manufacturing				Other New Economy Occupations		
	Agriculture and Conservation	Science and Engineering[1]	Design and Construction[2]	Total Green Related	Biology	Logistics	Medical Services[3]
United States	187.7	713.1	243.0	1,143.8	438.5	14.2	3,210.3
Alabama	153.4	1,337.0	170.0	1,660.4	447.9	272.5	3,109.3
Alaska	98.9	611.2	116.7	826.8	237.4	41.5	1,839.6
Arizona	132.7	559.4	351.6	1,043.7	352.4	14.8	5,214.0
Arkansas	193.7	431.6	74.3	699.7	305.2	21.4	3,530.4
California	171.7	624.5	274.3	1,070.5	493.5	3.8	2,874.0
Colorado	290.9	855.1	622.3	1,768.4	518.4	5.1	3,591.0
Connecticut	153.9	775.8	308.2	1,237.9	507.4	0.0	2,505.6
Delaware	319.4	713.7	34.5	1,067.5	376.3	4.5	2,817.2
District of Columbia	50.0	837.7	618.9	1,506.7	1,613.0	0.0	6,183.0
Florida	109.3	493.0	153.3	755.6	269.1	6.8	3,889.2
Georgia	136.6	543.3	338.6	1,018.6	354.9	42.7	3,061.1
Hawaii	150.5	500.2	124.6	775.2	364.7	0.0	1,380.0
Idaho	454.9	719.8	147.7	1,322.4	460.3	0.0	2,594.4
Illinois	207.1	657.0	216.9	1,081.0	381.0	7.2	3,284.6
Indiana	156.9	1,002.9	201.1	1,360.9	387.0	0.8	3,050.5
Iowa	516.8	786.7	260.3	1,563.8	586.1	25.3	3,905.2
Kansas	342.4	853.2	324.4	1,520.0	398.5	3.3	4,599.5
Kentucky	210.1	903.8	661.8	1,775.7	328.5	0.0	3,951.0
Louisiana	199.8	717.7	407.8	1,325.3	475.6	0.0	4,150.2
Maine	337.9	497.3	193.0	1,028.1	465.6	0.0	2,567.9
Maryland	86.7	635.5	205.2	927.4	562.6	6.3	2,336.4
Massachusetts	145.6	1,076.1	260.4	1,482.1	670.5	2.2	3,056.9
Michigan	**130.0**	**1,154.2**	**174.8**	**1,458.9**	**423.1**	**57.3**	**3,433.9**
Minnesota	313.1	602.2	494.6	1,409.9	554.8	0.0	4,099.2
Mississippi	173.0	606.9	193.3	973.2	398.0	0.0	2,855.5
Missouri	200.2	749.2	168.1	1,117.6	462.8	6.9	3,651.2
Montana	593.1	882.9	332.8	1,808.8	480.4	0.0	1,584.7
Nebraska	484.7	736.0	386.0	1,606.7	584.2	0.0	3,436.3
Nevada	57.4	310.0	83.3	450.8	196.7	6.2	1,910.8
New Hampshire	349.9	735.1	175.0	1,260.0	374.4	1.0	2,251.1

Geographic Area	Alternative Energy and Green Design and Manufacturing				Other New Economy Occupations		
	Agriculture and Conservation	Science and Engineering[1]	Design and Construction [2]	Total Green Related	Biology	Logistics	Medical Services[3]
New Jersey	53.5	540.1	98.1	691.7	376.7	0.0	2,331.8
New Mexico	153.8	767.6	371.6	1,293.0	306.9	0.0	2,277.7
New York	127.4	715.4	225.6	1,068.4	448.2	2.3	2,587.4
North Carolina	305.9	727.6	289.6	1,323.1	449.1	6.4	2,274.5
North Dakota	609.9	1,939.6	517.9	3,067.3	587.9	0.0	3,803.1
Oklahoma	281.8	689.3	297.9	1,268.9	445.9	0.4	3,378.0
Oregon	283.7	559.1	175.9	1,018.6	370.9	25.3	2,488.6
Pennsylvania	124.2	902.6	337.0	1,363.9	498.4	10.9	3,459.7
Rhode Island	266.3	1,053.2	417.1	1,736.6	574.0	0.0	2,804.4
South Carolina	118.4	522.5	79.7	720.5	471.2	0.0	2,145.2
South Dakota	689.3	1,017.4	293.5	2,000.2	526.0	0.0	3,504.1
Tennessee	136.6	545.4	92.7	774.7	288.0	43.9	3,015.8
Texas	202.7	648.9	153.5	1,005.0	429.3	8.2	3,148.5
Utah	177.1	948.5	331.9	1,457.4	692.4	26.5	4,296.0
Vermont	774.0	731.3	727.2	2,232.5	650.0	0.0	1,761.2
Virginia	144.0	662.9	152.9	959.9	433.7	0.2	3,172.7
Washington	195.8	632.6	275.5	1,103.8	379.3	2.8	2,812.9
West Virginia	314.2	650.1	156.7	1,121.0	378.6	1.4	3,242.6
Wisconsin	294.9	726.1	316.0	1,337.0	670.5	9.5	4,788.1
Wyoming	689.4	822.8	237.2	1,749.4	444.8	0.0	2,606.9

1. Science and Engineering consists of Chemistry, Engineering, Engineering Technology and Geology degrees.
2. Design and Construction consists of Architecture, Construction Trades and Geography degrees.
3. Medical Services does not include MD and DO degrees.

Source: National Center for Education Statistics, 2008-2009 Integrated Post-Secondary Education Survey.

Top Ten States in Science and Engineering Degrees Completed in New Economy Related Occupations per One Million Adults (Age 18+), 2008-2009



Source: National Center for Education Statistics, 2008-2009 Integrated Post-Secondary Education Survey.

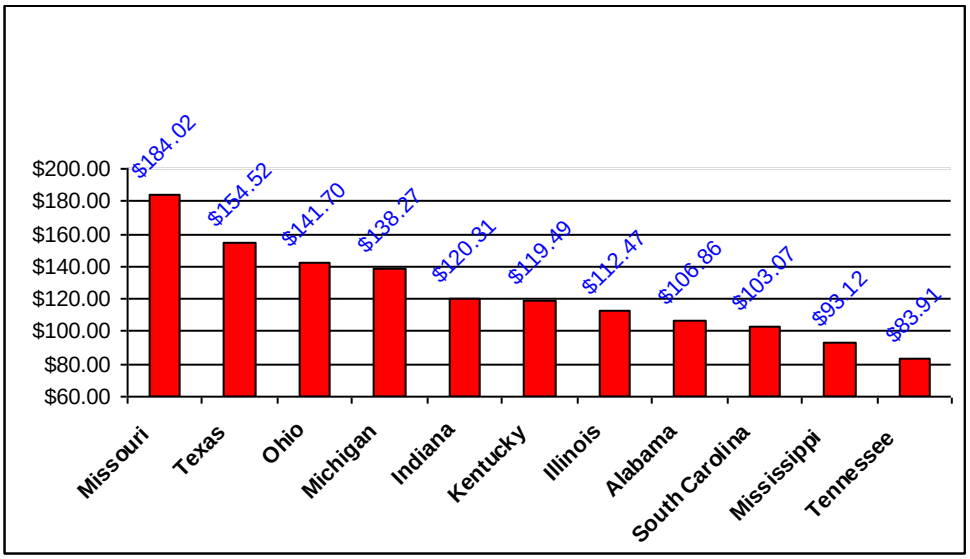
Labor Productivity

We earn what we produce. This is why productivity is so important. Over time, labor productivity growth ultimately drives gains in wages, incomes, and living standards. Labor productivity growth is closely tied to and provides a measure of economic competitiveness. Michigan's labor productivity continues to remain competitive as demonstrated by the following figures and tables.

Figure 13
Value Added Per Production Hour in Michigan, 1997-2007
All Manufacturing Total Workforce, in 2007 dollars

Value Added per Production Hour is the total value added of manufactured products divided by the number of manufacturing hours and measures how much of a manufactured product's value is added for each hour spent producing that product. The larger the number, the more productive the work force. This is a widely-accepted measure of worker productivity.
Source: Detroit Regional Chamber using data from the U.S. Census Bureau, Annual Survey of Manufacturers.

Value Added Per Production Hour, 2007
Transportation Equipment Manufacturing

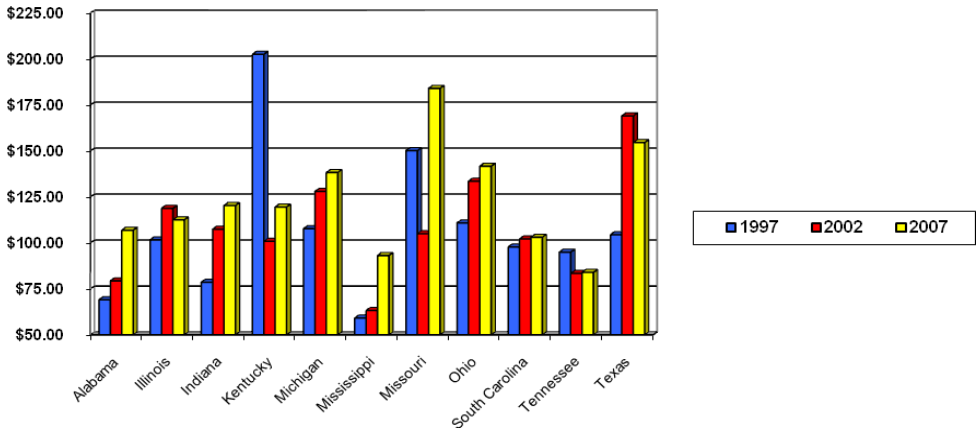


Source: U.S. Census Bureau, 2007 Economic Census.

States with More than One Automotive Manufacturing Plant

Michigan ranks as the 4th most productive state in transportation equipment manufacturing among states with more than one automotive manufacturing plant.

Value Added Per Production Hour, 1997, 2002, 2007
Transportation Equipment Manufacturing Total Workforce, in 2007 dollars
States with More than One Automotive Manufacturing Plant



Source: U.S. Bureau of the Census, Economic Census.

Unions Inspire Higher Productivity

According to the 2008 Harbour Report, the Top 10 most efficient (defined as the fewest hours per vehicle) automotive assembly plants in North America were unionized plants.

Top Performing Plants in the United States, 2007
Fewest Hours per Vehicle

Segment	Plant	Vehicles	Union Representation
Compact Non-Premium Conventional	Chrysler Belvedere	Caliber	UAW Local 1761 & 1268
Compact Non-Premium CUV	Chrysler Belvedere	Compass, Patriot	UAW Local 1761 & 1268
Compact Non-Premium	Chrysler Toledo South	Wrangler, Wrangler Extended	UAW Local 12
Midsize Premium Conventional	GM Lansing Grand River	STS	UAW Local 602
Midsize Premium Sports Car	GM Bowling Green	Corvette, XLR	UAW Local 2164
Midsize Premium CUV	Ford Oakville	MKX	CAW
Midsize Non-Premium Pickup	Ford Twin Cities	Mazda B-Series, Ranger	UAW Local 789
Midsize Non Premium Utility	Chrysler Jefferson North	Grand Cherokee	UAW Locals 7, 889 & 412
Midsize Non-Premium Utility	GM Moraine	Saab9-7x	IUE-CAW Local 798
Large Premium Conventional	GM Detroit-Hamtramck	DTS	UAW Local 21
Large Premium Pickup	Ford Dearborn Truck	Mark LT	UAW Local 600
Large Non-Premium Utility	GM Arlington	Suburban, Tahoe, Yukon, Yukon XL	UAW Local 276
Large Premium Utility	GM Arlington	Escalade, Escalade ESV	UAW Local 276
Large Non-Premium Van	GM Wentzville	Express, Savana	UAW Local 2250

Source: Oliver Wyman.