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Lead Authors

Tammy Coxen, Corporation for a Skilled Workforce
Lisa Hatcher, New River Community and Technical College

Contributions

Melissa Aguilar and Palma Stafford, Region 1 West Virginia Workforce Investment Board
Cindee Dresen and Leah Murphy, Corporation for a Skilled Workforce
Graphic Design: Linette Lao, Invisible Engines

West Virginia Region 1: Manufacturing Industry

EXECUTIVE SUMMARY 2010

Using one-on-one interviews and surveys, focus group discussions, and industry data analysis, Corporation for a Skilled Workforce authored this report highlighting the main opportunities and challenges facing the manufacturing industry in the Region 1 Workforce Development Area of West Virginia. This report first looks at the current conditions and economic climate within the region; then more narrowly analyzes the employer survey and interview responses, generating a detailed, first-hand description of southeastern West Virginia's manufacturing industry. This report concludes with key recommendations for improving industry conditions within the region.

About the Manufacturing Industry

This section of the report analyzes employment and industry trends within the 26 manufacturing subsectors in Region 1. While the first half of the previous decade was very successful for the region's manufacturers, in recent years, the industry has been plagued by the same declines that are facing manufacturers across the country. Though the industry is generally facing declines, growth rates vary among the different manufacturing subsectors. Of the top 14 largest subsectors in the region, forestry and wood product manufacturing subsectors have experienced employment declines; while growing industries include aerospace product and parts manufacturing; agricultural, construction, and mining machinery manufacturing; and semiconductor and electronic component manufacturing.

The study identified 31 key occupations across 7 categories: production workers, machine operators, transportation and distribution workers, maintenance and service workers, engineering workers, maintenance and service workers, logging workers, and other. Though some of these occupational categories saw growth through 2008, employment in all seven is projected to decline through 2013. However, jobs will still be available through turnover and retirement. With respect to wages, these seven occupational categories tend to pay slightly below the region's median wage, though there is great variance within the categories, with production workers being paid the least and engineering and managerial employees the most. Wage differences often



reflect employees' varying levels of education. While most of the jobs within the manufacturing industry require more on-the-job training than formal education, highly skilled or well-educated employees tend to earn higher wages than other employees.

Workforce Challenges and Opportunities

Due in large part to the current economic climate, nearly all employers explained that their companies are facing a challenging time. Employers pointed out a variety of specific challenges facing their businesses, ranging from lack of investments and high costs to difficult governmental policies and falling prices. Despite these challenges, many employers are optimistic and hopeful that growth will occur once the economy rebounds.

Amidst this, many of the region's employers identified the region's workforce as an asset, with relatively low wages and a good supply of middle-skilled workers. However, when it came to high-skill positions such as engineering, recruitment was a significant challenge for many businesses. At the unskilled worker level, employers faced shortcomings in worker quality stemming from low literacy, drug use and absenteeism.

This lack of highly skilled workers is due, in part, to area training and educational programs. There are few manufacturing affiliated training programs within the region, at a time when skills acquired through formal training are becoming increasingly important to the industry. These jobs

that require highly skilled, formally educated employees tend to be critical roles within the manufacturing industry. Half of the interviewees reported high to moderate demand for these employees and increased demand in the future. Looking ahead, employers projected needing more engineers and “green” manufacturing specialists.

Along with formally trained skills, employers also identified several social skills and soft skills that are important for potential employees to have. These included characteristics such as positive attitudes and willingness to come to work, attention spans, and adaptability. Employers also mentioned critical thinking skills, math skills, strong communication skills, and problem solving skills as being key training needs and desirable attributes for employees. Also of increasing importance are computer skills and IT personnel. Nearly all employers interviewed indicated that computers and IT are very important to their business, and most require basic computer skills as a prerequisite for hiring.

Skill shortages such as these make it hard for businesses to compete, innovate and grow in an economic environment that requires diversification and reinvention. They are looking to the region’s education and training providers to help them “upskill” their workforce so that they can remain competitive.

Recommended Actions

In response to the collected data and employer responses, Section 3 of this report contains several recommended actions for aiding manufacturing industry growth and rebuilding within the region.

The recommended actions include:

- Convening industry partnerships to learn more and collaboratively address workforce challenges facing the region’s manufacturing industry;
- Connecting with education and training providers to increase training offerings;
- Promoting soft skills and career readiness training;
- Working with the K-12, adult education, and postsecondary education systems to ensure they prepare students with strong foundational skills;
- Strengthening industry innovation through competitiveness; and
- Conducting marketing campaigns to increase awareness of highly skilled job offerings within the industry.

Introduction & Methodology

In April of 2009, the Region 1 Workforce Investment Board launched a project to take an in depth look at the manufacturing industry, considered one of the region's most critical industries along with protective services and construction. Due to the poor economic climate, manufacturing employees across the nation saw massive layoffs day-after-day and month-after-month in 2009. Manufacturers in southeastern West Virginia were not immune with the first company of the year announcing a major reduction in staff as early as January 29, 2009. Manufacturers across the state and the nation rushed to stabilize their companies by improving processes and streamlining their workforce throughout the year.

Recognizing that the industry was in the midst of a metamorphosis, Region 1 embarked on this project in order to gain an understanding of the workforce challenges and opportunities faced by the region's employers. Ultimately, this project aims to help better broker training and other solutions that would assist the region's manufacturers in adjusting to the evolving market and positioning themselves for future growth and sustainability. To help it meet these goals, Region 1 contracted with Corporation for a Skilled Workforce (CSW) to conduct an industry sector analysis.

The project began with an in-depth look at the industry, summarized in Section 1, which included reviewing employment trends, projected growth, location quotients, occupational characteristics, regional training programs, and area graduates. Analysis of the data revealed potential gaps between the occupational supply and demand; however, to really get a sense of what is happening in this industry, CSW went directly to the region's employers. Through a combination of focus groups, one-on-one interviews, and surveys, the project connected with employers across the region. Section 2 describes the workforce challenges and opportunities manufacturing employers described.

From this collected data, both primary and secondary, a set of recommendations for action were created. These will provide a roadmap for moving forward in addressing the collective and individual challenges of these three industries. Section 3 contains the recommendations specific to the Manufacturing industry.

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Section 1:

ABOUT THE MANUFACTURING INDUSTRY IN REGION 1

Takes a Licking, Keeps on Ticking. In 2008, the region’s manufacturing industry employed 5,838 workers across 26 NAICS 4-digit industry subsectors covering a wide range of manufacturing and production. In the middle of the last decade, these subsectors were quite healthy in Region 1. Employment was actually growing while the same industries in the state and nation were staying flat. However, the industry peaked in 2005, with a slow decline between 2005 and 2008 projected to become a sharp drop in 2009 (2009 data is preliminary). Even so, the industry is declining more slowly in the region than in the state (see Figure 1).

The largest 14 industries (employing at least 150 workers in 2008) made up 87% of all employment in manufacturing, and represented 70% of all manufacturing establishments (see Table 1). The historical importance to the region of forestry and wood product manufacturing is apparent from the data, with *sawmills and wood preservation, other wood product manufacturing, and plywood and engineered wood product manufacturing* all appearing in the top 14 list. These three industries made up 32% of total manufacturing employment in the region in 2008, and all have high location quotients (a measure of the concentration of employment in the region relative to the national concentration). However, employment in these industries declined from 2003 to 2008 and future declines are projected in two of the three subsectors. For example, in

January 2009, Georgia-Pacific Corporation in Mount Hope laid off 70 of its 113 employees.

Among the other top 14 industries, there are several industries that have shown strong growth through 2008. The largest of these is *aerospace product and parts manufacturing* which grew by 57% from 2003-2008, but is projected to decline slightly by 2013. With only two establishments holding this concentrated employment, the industry is potentially volatile. *Agricultural, construction, and mining machinery manufacturing* also experienced high growth from 2003 to 2008, expanding by 85%. However, significant declines are projected through 2008.

The most dramatic growth occurred in *semiconductor and electronic component manufacturing*, which more than tripled in size between 2003 and 2008 and is project-

Figure 1. Industry Growth. Source: Economic Modeling Specialists Inc. (EMSI)

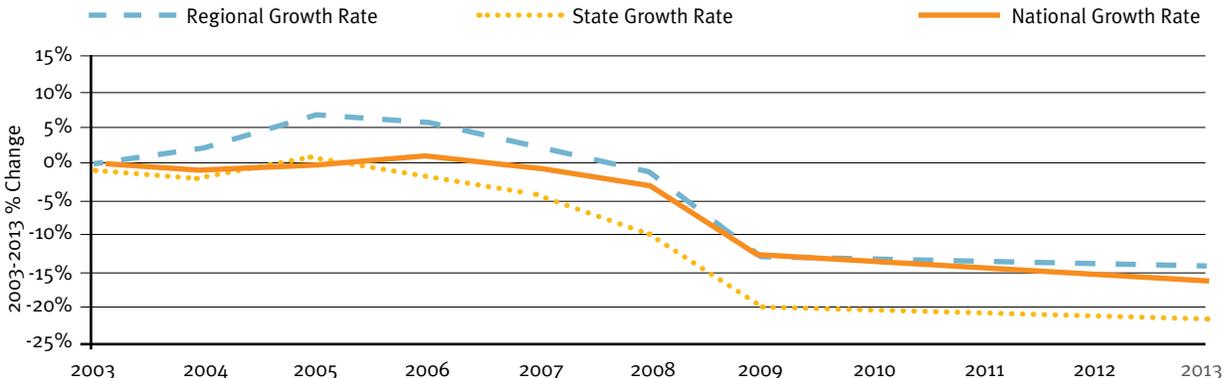


Table 1. Trends, Top 14 Industries. Source: Economic Modeling Specialists Inc. (EMSI)

Description	2003 Jobs	2008 Jobs	Change 03-08	2013 Jobs	Change 08-13	2008 Estab.	Location Quotient
Sawmills and wood preservation	1,092	992	(9%)	661	(33%)	38	11.75
Machine shops and threaded product mfg.	722	739	2%	625	(15%)	50	2.43
Other wood product manufacturing	582	511	(12%)	616	21%	20	2.32
Aerospace product and parts manufacturing	263	413	57%	364	(12%)	2	0.98
Plywood and engineered wood product mfg.	558	340	(39%)	304	(11%)	5	4.47
Ag., construction, and mining machinery mfg.	172	319	85%	246	(23%)	9	1.61
Electronic instrument manufacturing	501	294	(41%)	171	(42%)	3	0.80
Iron and steel mills and ferroalloy mfg.	189	260	38%	176	(32%)	2	3.08
Cement and concrete product manufacturing	264	259	(2%)	239	(8%)	18	1.39
Semiconductor and electronic component mfg.	80	251	214%	307	22%	5	0.69
Bakeries and tortilla manufacturing	128	220	72%	227	3%	7	0.95
Rubber product manufacturing	144	181	26%	141	(22%)	7	1.48
Electrical equipment manufacturing	65	161	148%	153	(5%)	8	1.21
Other general purpose machinery manufacturing	140	151	8%	165	9%	9	0.66

ed to continue to grow through 2013. *Electrical equipment manufacturing* also experienced very significant growth, with only small declines projected.

Key Occupations

Data analysis identified 31 key occupations for the manufacturing industry in West Virginia. For ease of analysis, particularly in later surveying work, these 31 key occupations were divided into 7 categories – production workers, machine operators, transportation and distribution workers, maintenance and service workers, engineering workers, maintenance and service workers, logging workers, and other. Occupations included in each category are shown in the Table 2, page 7.

It is important to note that while all of these occupations are likely to be important to the manufacturing industry, the manufacturing industry is not necessarily the dominant employer of those workers. As the following table shows, it is not uncommon for many or a majority of workers in certain occupations to be employed in non-manufacturing industries. This is important to consider

when thinking about supply-demand gap analysis, as it means that not all graduates of training programs will be available to fill the demand within the manufacturing industry, for critically important occupations. Occupations marked with stars in Table 2 (page 7) have at least 50% occupation holders working within the manufacturing

The most dramatic growth occurred in semiconductor and electronic component manufacturing, which more than tripled in size between 2003 and 2008 and is projected to continue to grow through 2013.

industry.

Within the two largest categories – Machine Operators and Production Workers – most of the occupations are largely exclusive to the manufacturing industry (see Table 2, page 7). However, when it comes to roles in transportation and distribution, maintenance and service, and engineering workers, the region’s manufacturing employers face competition for workers from other industries.

The top seven occupations make up at least 4% of total industry employment each, and total 33% of all industry employment. Those occupations include:

- *Laborers and Freight, Stock, and Material Movers, Hand*
- *Machinists*
- *Welders, Cutters, Solderers, and Brazers*
- *Sawing Machine Setters, Operators, and Tenders (wood)*
- *Inspectors, Testers, Sorters, Samplers, and Weighers*
- *Team Assemblers*
- *Truck Drivers, (heavy and tractor-trailer)*

While these occupations account for many of the positions in manufacturing, there are a vast array of other occupations in the industry, many specific to an industry subsector. Highly skilled workers – like engineers – are needed in smaller numbers, but are still vital to the operation of the industry, and can frequently be the most difficult positions to fill (see Section 2).

The 2003-2008 period saw small increases in the machine operator, maintenance and repair worker, and engineering worker categories. Within the machine operator category this growth was primarily fueled by large increases in the occupations of *Welders, Cutters, Solderers, and Brazers* and *Chemical Plant and System Operators*, and to a lesser extent by *Machinists*. All other categories saw small to moderate declines over the same period (see Table 3, page 8).

However, in keeping with the projected declines in the manufacturing industry within the region, employment in all seven of the occupational categories is projected to decline through 2013. Note that these figures reflect only workers employed in these occupations within manufacturing, not across all industries.

Even when an occupation is declining in overall number of workers, there are still job openings created due to turnover and retirement (see Table 4, page 9). From 2008-2013 the occupations with the largest number of projected annual openings (across all industries, not just manufacturing) are

- *Laborers and Freight, Stock, and Material Movers, Hand,*
- *Welders, Cutters, Solderers, and Brazers,*
- *Truck Drivers (heavy and tractor-trailer),*
- *Sales Representatives (wholesale and manufacturing, except technical and scientific products), and*
- *Industrial Machinery Mechanics.*

Note that for all of these occupations, the majority of workers are employed in non-manufacturing industries. Unless the projected manufacturing decline turns around, employment opportunities may be limited in the industry.

In 2008, the median wage for all jobs in Region 1 was \$14.33/hr. When looking at the average median wage for each of the seven occupational categories, the average median wage of most categories is slightly below this figure, with production workers being the lowest paid category (see Table 5, page 10). Engineering workers and those in the “other” category have some of the highest wages, and these occupations generally require more formal education bachelor’s and associate degrees for engineering workers, or significant prior experience.

There are significant differences within categories. Within the relatively low paying production worker category, 1) *Structural Metal Fabricators and Cutters*, 2) *Pourers and Casters, Metal, and* 3) *Cabinetmakers and Bench Carpenters* all earn wages above the median. Within the machine operators category, two occupations within the chemical industry subsector – *Chemical Plant and System Operators* and *Chemical Equipment Operators and Tenders* pay much higher wages than average.

For most occupations in manufacturing, training usually occurs on-the-job and formal post-secondary education is not generally required. However, occupations such as those at the top end of the machine operator jobs category are skilled occupations and require workers to be able to perform at a high level (see Section 2).

The Educational Attainment Cluster column in Table 5 (page 10) describes the education level of workers aged 25-44 employed in this occupation nationwide and provides some insight into employer hiring practices. While many workers will only have a high school diploma, there are also many workers with some college education in most of these occupations.

Table 2. Cross-Industry Occupational Employment of Key Occupations

Source: Economic Modeling Specialists Inc. (EMSI) (★ denotes higher than 50% Cross industry)

Description	2008 Jobs	% of Industry	2008 Cross Industry Jobs	% Cross Industry
Production Workers				
Laborers and freight, stock, and material movers, hand	425	7%	2,605	16%
★ Team assemblers	208	4%	293	71%
★ Electrical and electronic equipment assemblers	149	3%	160	93%
★ Helpers--Production workers	142	2%	235	60%
★ Assemblers and fabricators, all other	94	2%	157	60%
★ Pourers and casters, metal	55	1%	55	100%
★ Structural metal fabricators and fitters	49	1%	58	84%
★ Cabinetmakers and bench carpenters	42	1%	49	86%
Machine Operators				
★ Machinists	335	6%	475	71%
★ Sawing machine setters, operators, and tenders, wood	251	4%	253	99%
Welders, cutters, solderers, and brazers	246	4%	705	35%
★ Machine feeders and offbearers	107	2%	122	88%
★ Woodworking machine setters, operators, and tenders, except sawing	79	1%	82	96%
★ Chemical plant and system operators	53	1%	88	60%
★ Cutting, punching, and press machine setters, operators, and tenders, metal and plastic	50	1%	64	78%
★ Coating, painting, and spraying machine setters, operators, and tenders	37	1%	40	93%
Chemical equipment operators and tenders	33	1%	84	39%
Transportation and Distribution Workers				
Truck drivers, heavy and tractor-trailer	215	4%	2,519	9%
Industrial truck and tractor operators	74	1%	188	39%
Truck drivers, light or delivery services	39	1%	907	4%
Maintenance and Repair Workers				
Maintenance and repair workers, general	141	2%	1,563	9%
Industrial machinery mechanics	75	1%	475	16%
Logging Workers				
Logging equipment operators	51	1%	274	19%
★ Log graders and scalers	44	1%	55	80%
Engineering Workers				
Mechanical engineers	32	1%	71	45%
Other				
★ Inspectors, testers, sorters, samplers, and weighers	214	4%	369	58%
★ First-line supervisors/managers of production and operating workers	171	3%	318	54%
Sales representatives, wholesale and manufacturing, except technical and scientific products	97	2%	839	12%
Shipping, receiving, and traffic clerks	57	1%	333	17%
Purchasing agents, except wholesale, retail, and farm products	48	1%	180	27%

Table 3. Industry-Specific Occupational Trends

Source: Economic Modeling Specialists Inc. (EMSI)

Description	2003 Jobs	2008 Jobs	03-08 % Change	2013 Jobs	08-13 % Change
Production Workers	1,220	1,164	(5%)	1,002	(14%)
Laborers and freight, stock, and material movers, hand	489	425	(13%)	333	(22%)
Team assemblers	220	208	(5%)	201	(3%)
Electrical and electronic equipment assemblers	121	149	23%	130	(13%)
Assemblers and fabricators, all other	118	94	(20%)	87	(7%)
Helpers--Production workers	149	142	(5%)	124	(13%)
Structural metal fabricators and fitters	36	49	36%	46	(6%)
Pourers and casters, metal	38	55	45%	38	(31%)
Cabinetmakers and bench carpenters	49	42	(14%)	43	2%
Machine Operators	1,162	1,191	2%	1,032	(13%)
Machinists	304	335	10%	292	(13%)
Welders, cutters, solderers, and brazers	188	246	31%	224	(9%)
Sawing machine setters, operators, and tenders, wood	280	251	(10%)	208	(17%)
Machine feeders and offbearers	132	107	(19%)	84	(21%)
Cutting, punching, and press machine setters, operators, and tenders, metal and plastic	50	50	0%	44	(12%)
Woodworking machine setters, operators, and tenders, except sawing	93	79	(15%)	78	(1%)
Chemical plant and system operators	43	53	23%	42	(21%)
Chemical equipment operators and tenders	37	33	(11%)	28	(15%)
Coating, painting, and spraying machine setters, operators, and tenders	35	37	6%	32	(14%)
Transportation and Distribution Workers	358	328	(8%)	287	(13%)
Truck drivers, heavy and tractor-trailer	231	215	(7%)	192	(11%)
Truck drivers, light or delivery services	41	39	(5%)	37	(5%)
Industrial truck and tractor operators	86	74	(14%)	58	(22%)
Maintenance and Repair Workers	208	216	4%	189	(13%)
Maintenance and repair workers, general	139	141	1%	120	(15%)
Industrial machinery mechanics	69	75	9%	69	(8%)
Logging Workers	105	95	(10%)	67	(29%)
Logging equipment operators	55	51	(7%)	36	(29%)
Log graders and scalers	50	44	(12%)	31	(30%)
Engineering Workers	29	32	10%	27	(16%)
Mechanical engineers	29	32	10%	27	(16%)
Other	617	620	0%	545	(12%)
Inspectors, testers, sorters, samplers, and weighers	205	214	4%	182	(15%)
First-line supervisors/managers of production and operating workers	171	171	0%	152	(11%)
Sales representatives, wholesale and manufacturing, except technical and scientific products	106	97	(8%)	88	(9%)
Industrial production managers	33	33	0%	30	(9%)
Purchasing agents, except wholesale, retail, and farm products	45	48	7%	42	(13%)
Shipping, receiving, and traffic clerks	57	57	0%	51	(11%)

Table 4. Cross-Industry Annual Openings Source: Economic Modeling Specialists Inc. (EMSI)

Description	2008 Manufacturing Jobs	2008 Cross- Industry Jobs	08-13 Annual Openings
Production Workers			
Laborers and freight, stock, and material movers, hand	425	2,605	76
Electrical and electronic equipment assemblers	149	160	7
Team assemblers	208	293	6
Helpers--Production workers	142	235	5
Assemblers and fabricators, all other	94	157	4
Pourers and casters, metal	55	55	1
Cabinetmakers and bench carpenters	42	49	1
Structural metal fabricators and fitters	49	58	1
Machine Operators			
Welders, cutters, solderers, and brazers	246	705	14
Machinists	335	475	8
Sawing machine setters, operators, and tenders, wood	251	253	4
Chemical equipment operators and tenders	33	84	4
Machine feeders and offbearers	107	122	3
Chemical plant and system operators	53	88	3
Cutting, punching, and press machine setters, operators, and tenders, metal and plastic	50	64	2
Woodworking machine setters, operators, and tenders, except sawing	79	82	2
Coating, painting, and spraying machine setters, operators, and tenders	37	40	1
Transportation and Distribution Workers			
Truck drivers, heavy and tractor-trailer	215	2,519	41
Truck drivers, light or delivery services	39	907	15
Industrial truck and tractor operators	74	188	5
Maintenance and Repair Workers			
Industrial machinery mechanics	75	475	12
Maintenance and repair workers, general	141	1,563	4
Logging Workers			
Logging equipment operators	51	274	5
Log graders and scalers	44	55	1
Engineering Workers			
Mechanical engineers	32	71	1
Other			
Sales representatives, wholesale and manufacturing, except technical and scientific products	97	839	17
Shipping, receiving, and traffic clerks	57	333	8
Inspectors, testers, sorters, samplers, and weighers	214	369	7
First-line supervisors/managers of production and operating workers	171	318	6
Purchasing agents, except wholesale, retail, and farm products	48	180	4
Industrial production managers	33	54	2

Table 5. Cross-Industry Wage and Education Characteristics

Source: Economic Modeling Specialists Inc. (EMS)

Description	2008 Jobs	Current Hourly Earnings	Most Significant Source of Skills Attainment	Educational Attainment-Cluster
Production Workers		\$11.11		
Laborers and freight, stock, and material movers, hand	425	\$9.54	Short-term OJT	HS/SC
Team assemblers	208	\$12.56	Moderate-term OJT	HS/SC
Electrical and electronic equipment assemblers	149	\$11.17	Short-term OJT	HS/SC
Assemblers and fabricators, all other	94	\$7.60	Moderate-term OJT	HS/SC
Helpers--Production workers	142	\$12.16	Short-term OJT	HS
Structural metal fabricators and fitters	49	\$15.25	Moderate-term OJT	HS/SC
Pourers and casters, metal	55	\$14.63	Moderate-term OJT	HS/SC
Cabinetmakers and bench carpenters	42	\$14.42	Long-term OJT	HS/SC
Machine Operators		\$13.24		
Machinists		\$14.09	Long-term OJT	HS/SC
Welders, cutters, solderers, and brazers	246	\$14.43	Long-term OJT	HS/SC
Sawing machine setters, operators, and tenders, wood	251	\$9.66	Moderate-term OJT	HS
Machine feeders and offbearers	107	\$11.29	Short-term OJT	HS/SC
Cutting, punching, and press machine setters, operators, and tenders, metal and plastic	50	\$12.43	Moderate-term OJT	HS/SC
Woodworking machine setters, operators, and tenders, except sawing	79	\$12.14	Moderate-term OJT	HS
Chemical plant and system operators	53	\$23.27	Long-term OJT	HS/SC
Chemical equipment operators and tenders	33	\$18.30	Moderate-term OJT	HS/SC
Coating, painting, and spraying machine setters, operators, and tenders	37	\$12.05	Moderate-term OJT	HS/SC
Transportation and Distribution Workers		\$12.49		
Truck drivers, heavy and tractor-trailer	215	\$12.94	Moderate-term OJT	HS/SC
Truck drivers, light or delivery services	39	\$9.27	Short-term OJT	HS/SC
Industrial truck and tractor operators	74	\$12.87	Short-term OJT	HS
Maintenance and Repair Workers		\$12.54		
Maintenance and repair workers, general	141	\$12.40	Moderate-term OJT	HS/SC
Industrial machinery mechanics	75	\$17.84	Long-term OJT	HS/SC
Logging Workers		\$12.54		
Logging equipment operators	51	\$11.60	Moderate-term OJT	HS
Log graders and scalers	44	\$13.63	Moderate-term OJT	HS
Engineering Workers		\$24.56		
Mechanical engineers	32	\$24.56	Bachelor's degree	C
Others		\$17.50		
Inspectors, testers, sorters, samplers, and weighers	214	\$12.85	Moderate-term OJT	HS/SC
First-line supervisors/managers of production and operating workers	171	\$21.13	Work experience in a related field	HS/SC
Sales representatives, wholesale and manufacturing, except technical and scientific products	97	\$18.28	Moderate-term OJT	HS/SC/C
Industrial production managers	33	\$34.39	Work experience in a related field	HS/SC/C
Purchasing agents, except wholesale, retail, and farm products	48	\$20.85	Work experience in a related field	HS/SC/C
Shipping, receiving, and traffic clerks	57	\$10.17	Short-term OJT	HS/SC

HS = High School, SC = Some College, C = College Degree

Section 2:

WORKFORCE CHALLENGES AND OPPORTUNITIES

Business Slump. Although they experienced steady growth throughout the last decade, Region 1 manufacturers are feeling the recession. Almost all of the interviewed employers explained that with the current economic climate, their companies are facing a challenging time.

Some of the companies are facing stiff foreign competition; some are being forced to cut employees; and many are just trying to stay afloat and wait out these tough times.

Employers interviewed pointed to a number of specific factors as being challenges for their businesses and the industry as a whole. These included:

- Lack of business investment
- Difficult processes surrounding mining and water permits
- Federal Cap and Trade policy
- Overabundance of lumber production and consequent falling prices
- Cost of materials
- Containing employee health care/benefit costs and
- Decreased air travel

While employers are feeling these challenges, many businesses are using this as an opportunity to diversify into new markets, develop new products, and otherwise respond to hardship with innovation. Many spoke hopefully about future expansion and training plans once the economy turns around. During a community forum on job creation and economic development held on January 7, 2010, the region's manufacturers stated they remain optimistic.

Mixed Perceptions of the Workforce

Manufacturing employers expressed a wide variety of often contradictory opinions about the strengths and weak-

nesses of operating in Region 1. While many interviewees expressed concerns about workforce skills (100% of survey respondents reported having trouble finding enough applicants with the required skills), quite a few expressed that the local workforce was also a major strength of the region. Sample employer comments included:

"Low wages in the region are a strength."

"The skilled labor pool is good, but the unskilled labor pool is not. I had to go through 200 people to fill 8 unskilled labor positions."

"People are the reason we stay in West Virginia. But it is difficult to find people with a good educational background when filling professional positions, and it is difficult to recruit them to the area."

"There is a lot of talent here."

"We find that absenteeism is a problem."

"The skilled labor positions in my organization have grown because I would rather have someone I depend on who is also overqualified for certain tasks and pay them a little more than continue to run through unskilled positions with people I cannot depend on."

Many spoke hopefully about future expansion and training plans once the economy turns around.

It is hard to draw generalizations across the many different kinds of manufacturing businesses that were interviewed and surveyed, all of whom have different needs. However, for the most part, it seems that employers in the region are generally satisfied with the availability

of mid-skilled workers, especially those in subsectors where the region has longstanding strengths, such as wood products, machine shops, and electronic instrument manufacturing. However, they are often frustrated by work ethic and reliability of low- and un-skilled workers for their entry level positions.

This skill gap is further exacerbated when it comes to highly skilled positions. Particularly with respect to engineering positions, employers are struggling to find workers with the appropriate credentials. This challenge could get even more pronounced, because as manufacturers incorporate new technology and computers become more prevalent in the workforce, employers will need even more workers with skills in critical thinking and problem solving. Future workers at all levels will need the ability to understand and use systems in order to analyze and make meaning of data, design or model solutions, or make decisions as part of daily business practices.

Education and Training Gaps

Some reasons for employers' concerns about the availability of skilled workers can be traced back to the education and training program offerings for the region. While many occupations on the key occupation list don't have a defined educational pathway,¹ all the other occupations on the list do have affiliated programs. **However, few of these programs are offered in the region.**

Table 6 lists the three applicable programs that are offered. These programs train workers for the following positions from the key occupations list given in Section 1:

- Mechanical Engineers
- Welders, Cutters, Solderers, and Brazers
- First-Line Supervisors/Managers of Production and Operating Workers
- Industrial Production Managers

Traditionally, many of the remaining occupations required skills that could be learned on-the-job. However, many of these now require skills – such as CNC programming, and, as previously mentioned, critical thinking and problem solving – that may be more effectively learned through formal education.

As one employer said *“It is tough to bring in young blood because they aren’t trained.”*

Occupations and Skills in Demand

Due to the diversity of manufacturing environments, there was also a wide array of critical and hard-to-fill occupations mentioned by employers (see Table 7). Hard-to-fill occupations are mostly those requiring greater skills. For instance, while 78% of survey respondents identified production workers as critical to their businesses, only 36% said they were hard to fill. Compare this to the 43% of all respondents who identified engineering workers as critical, and 50% of all respondents who identified these occupations as hard-to-fill.

Formal education and training was crucial for employers when it came to these critical and hard-to-fill occupations. 72% of surveyed employers stated that some formal training or apprenticeship was either required or very

Table 6. Average Number of Program Completions 2007-2008

Source: National Center for Education Statistics

CIP Description	Institution Name	> 1 but < 2	Associate Degree	Bachelor's Degree
Mechanical Engineering	West Virginia University Institute of Technology	0	0	32
Welding Technology/ Welder	Academy of Careers and Technology	9	0	0
Operations Management & Supervision	West Virginia University Institute of Technology	0	0	10

Table 7. Critical and Hard to Fill Occupations

- Engineers
- Quality control
- Maintenance workers
- Machinists
- Machine Operators (including CNC)
- Mechanics
- Sales

1 1)Team Assemblers, 2) Assemblers and Fabricators, All Other, 3) Helpers, 4) Production Workers, 5) Laborers and Freight, Stock, and Material Movers, Hand, 6)Machine Feeders and Offbearers, 7) Pourers and casters, metal, 8) Coating, painting, and spraying machine setters, operators, and tenders.

important. Faced with a shortage of skilled and credential machinists, one employer reported partnering with the Robert C Byrd Institute to develop an apprenticeship program for machinists. Another interviewee was developing an internal program to train employees to become millwrights.

Despite the economic slump, 50% of surveyed employers reported moderate to high demand for their critical and hard-to-fill occupations at this time, and projected needing slightly more workers in the near and long term future. Looking ahead, employers projected needing more engineers. One employer also anticipated rising demand for workers with energy management knowledge and solar panel installation technicians.

In addition to the necessary credentials and job skills, employers identified multiple social characteristics as being important in their new hires. These included: attention span, attitude and willingness to come to work, and an ability to adapt to cultural change in the workplace that demanded a “faster pace of life.”

Critical thinking skills were mentioned repeatedly as a training need or desirable attribute, along with communication, problem solving and strong work ethic. Other specific training needs included math skills, technology (each mentioned by multiple employers), HVAC controls

and CNC programming (mentioned by one employer each). Several employers also reported using Work Keys to screen employees for experience and knowledge as part of their interview process.

Increased Use of Computers

Information technology and computers play an important role in the manufacturing industry and are becoming a more and more crucial part of doing business in the modern economy. Nearly all employers interviewed indicated that computers and IT are very important to their business. Employers indicated using them for operations, production, training, and administrative purposes. Most considered basic computer skills a prerequisite for hiring. Of all the interviewees, only three did not believe computers were a large part of their operations, and in all these cases, the respondents worked in manual labor factories where employees in office roles used computers, but the majority of laborers did not.

Across the companies, IT needs were generally met through internal staff, with a handful of companies outsourcing some functions to external providers. Web development services were most likely to be outsourced. Computer training for workers was usually provided through on-the-job training.



Conclusions and Recommended Actions

While the first half of the previous decade was a very successful one for Region 1 manufacturers, in recent years the industry has been plagued by the same declines that are facing manufacturers across the country. There are many factors impacting the industry, such as health care costs, state and federal regulations, overseas competition, and the global economic recession.

Amidst this, many of the region's employers identified the region's workforce as an asset, with relatively low wages and a good supply of middle-skilled workers. However, when it came to high-skill positions such as engineering, recruitment was a significant challenge for many businesses. At the unskilled worker level, employers faced

shortcomings in worker quality stemming from low literacy, drug use and absenteeism.

All of these factors make it hard for businesses to compete, innovate and grow in an economic environment that requires diversification and reinvention. They are looking to the region's education and training providers to help them "upskill" their workforce so that they can remain competitive.

Recommended Actions

The recommended actions below are geared towards a broad stakeholder audience of workforce development, employers, education, government, community-based and economic development actors, each of which may have a role to play in carrying out different recommendations.

- ✓ **Convene industry partnership to verify findings, learn more, and collaboratively address workforce challenges facing the region.**

Some employers surveyed expressed interest in becoming involved in an industry partnership that would help them identify common workforce challenges (i.e., skill training, recruitment, talent pipeline, talent retention, etc.) and work together on solutions.

The region may want to investigate models, such as The SOURCE (Grand Rapids, Michigan, www.grsource.org), which have successfully used the industry partnership model to address worker quality issues by providing a variety of on-site supports for low-wage, low-skill workers.

- ✓ **Connect with education and training providers to determine root causes for small variety of program offerings**

Historically, 4 year institutions in the region have not invested in technical training, and the community and technical college system in the region is still young. An industry partnership could help develop and support technical training programs in the key areas identified by industry representatives.

✓ **Promote and/or develop programs such as soft-skills training and career readiness certificates**

There are several programs already in place, such as the WV Career Readiness Certificates (utilizing Work Keys), SPOKES Program (Strategic Planning in Occupational Knowledge for Success) offered through Adult Basic Education, and WORK 101 and WORK 102 offered through the community college system.

✓ **Work with the K-12, adult education, and postsecondary education systems to ensure they prepare students with strong foundational skills.**

In our global economy, job skill requirements are changing at an ever increasing rate. Workers need to gain new knowledge and learn new skills throughout their career. This need for life-long learning makes strong skills in math, reading, problem solving, and critical thinking ever more important as the foundation for all future learning. Students and workers must “learn how to learn”.

✓ **Strengthen industry competitiveness through innovation**

Engage and support employers in becoming preferred places to work by looking at the acquisition and development of talent as a key productivity, retention, and innovation strategy. The WIB can support this by developing an integrated regional talent strategy that would better position the WIB and its business services unit to partner with area business, and better position area business to attract skilled workers to be competitive in the marketplace.

✓ **Move post secondary education collaborative efforts to the next level.**

By building and improving feedback loops between employers and the higher educational system, employers can emphasize the importance of balancing soft skills and technical skills as an overall package of skills that a prospective employee brings to the table. Connections should be made with curriculum committees, faculty, and career services offices.

One outcome could be a collaborative public-private partnership between employers and the university and community technical college system where the skill needs identified by employers, particularly in hard-to-fill occupations like engineering, can be used to help transform curriculum offerings.

✓ **Conduct a marketing and education campaign to promote higher skilled workers and students into the industry and region.**

This could include launching a “Dream It Do It” campaign, sponsored by the National Association of Manufacturers (<http://www.nam.org/AboutUs.aspx>), to help educate young adults, parents, educators, and communities to view manufacturing as one of the preferred career choices in the region.

Also, explore opportunities to partner with area middle schools, high schools, and vocational schools to promote manufacturing careers in the “Exploring Technology” and “Career Exploration” classes.