

CHAPTER 6: EMPLOYER DEMAND IN GREEN COMPONENT MANUFACTURING

Highlights

- *The Component Manufacturing cluster is the smallest of those included in the green jobs study and, with 5,360 green jobs, or 7 percent of the total employment in this cluster, has the least green employment.*
- *The Western NY/ Finger Lakes region has 1,580 green Component Manufacturing workers, the highest regional number by far. Long Island was second with 980 green jobs. While New York City has only 760 green jobs in this cluster, the proportion of total jobs that are green, at 13 percent, is nearly twice the average for the state.*
- *The manufacturing workforce in general is older, with nearly 60 percent of the workforce 45 year of age or older.*
- *There are a number of positive developments related to green Component Manufacturing in upstate New York. Some examples include the Solar Energy Consortium based in Kingston, the General Electric Schenectady-based global renewable energy headquarters and manufacturing plant making advanced storage batteries; Global Foundries' new semi-conductor plant in Malta; The Tech Garden in Syracuse; and the Globe Specialty Metals purified silicon plant in Niagara Falls.*
- *Of the 260 firms in Component Manufacturing with green employment, 34 percent of the total (90 firms), have difficulty recruiting qualified green workers. Employers upstate reported more difficulty than those downstate.*
- *Employers would like education and training institutions to educate with more cross-functionality. For example, employers say they need “engineers with stronger people skills and sales and marketing employees with stronger critical and analytical reasoning skills.” They say “this is necessary in order for companies to be able to grow, innovate and meet the demands of a market.”*

Overview of the Industry Cluster

For much of its history, New York State was a powerhouse of manufacturing activity. New York City was its largest manufacturing center, particularly known for its garment district (“the densest clothing manufacturing zone in the world”) but also prominent in many other manufacturing areas, from printing and publishing to fabricated metals. Manufacturing jobs were also a source of economic prosperity for upstate communities that hosted large manufacturing plants, such as Kodak in Rochester, General Motors and the auto industry in Buffalo, and General Electric in Schenectady. Other upstate cities, such as Binghamton, Elmira, Syracuse, Utica and the Albany-Troy-Rensselaer area have produced everything from shoes to computer and electrical products.

In the last 50 years New York State and City have endured a well-documented steady erosion of employment in the sector. In ten years between 2000 and 2010, overall manufacturing employment in New York State fell from 752,300 to 457,800, and now represents a little more than 5 percent of the state’s jobs (NYSDOL). Manufacturing employment in New York City peaked at one million in the 1950’s, with a third of these jobs in the apparel industry. As of February 2011 the number of people employed in manufacturing in New York City had dwindled to 73,600 (NYSDOL) and comprised approximately two percent of the New York City workforce.

By definition, the manufacturing sector is involved in the production of goods, involving the conversion of raw materials, components or parts into finished goods. These finished goods may be used for manufacturing other, more complex products, such as aircraft, household appliances or automobiles, or sold to wholesalers, who in turn sell them to retailers, who then sell them to end users – the consumers. Manufacturing may be handicraft, high tech, or mass production on a large scale. The North American Industrial Classification System (NAICS) identifies 20 major industries within the manufacturing sector.

For purposes of this green jobs research, *green manufacturing* was limited to manufacturing related to green technology, renewable energy and energy efficiency.¹ Together, these industries are referred to throughout this report as “Component Manufacturing.”

Distribution of Firms and Employment. In the fourth Quarter of 2010, there were 1,854 firms in the Component Manufacturing cluster in New York State, employing 80,458 people. The largest share of employment was in the Western New York/Finger Lakes region, with 22 percent of the firms and 30 percent of the employment in the State.

DISTRIBUTION OF COMPONENT MANUFACTURING FIRMS AND EMPLOYMENT BY REGION

	Firms		Employment	
	Number	Share of NYS	Number	Share of NYS
New York State	1,854		80,458	
Capital / Mohawk Valley /North Country	211	11%	10,819	13%
Central/Southern Tier	217	12%	17,026	21%
Hudson Valley	186	10%	8,847	11%
Long Island	442	24%	13,766	17%
New York City	326	18%	5,891	7%
Region Not Classified*	408	22%	23,978	30%
Western NY/Finger Lakes	64	4%	131	0%

SOURCE | 4Q 2010, QCEW

**Note: Refers to firms that do not provide a specific location in New York State.*

¹ This included such areas as window and door manufacturing, plastic material, glass products, copper wire, fabricated metal, air conditioning and heating equipment, general purpose machinery, semiconductors, other electric components, measuring devices, lighting fixtures, electronic equipment and components, motor vehicle and railroad stock, among others.

Component Manufacturing represents 1.2 percent of all employment statewide. As shown in the chart below, the share of area employment is highest in the upstate areas of Central NY/Southern Tier (3.5%) and Western NY/Finger Lakes (2.5%) and lowest in New York City (0.2%).

CONCENTRATION OF COMPONENT MANUFACTURING EMPLOYMENT BY REGION

New York State Region	% of Total Employment
Capital/Mohawk/North	1.7%
Central/Southern Tier	3.5%
Hudson Valley	1.3%
Long Island	1.4%
New York City	0.2%
Western/Finger Lakes	2.5%

SOURCE | 4Q 2010, QCEW

Of the 1,837 Component Manufacturing firms in New York State, more than three in five (62%) had 20 or fewer employees, with 35 percent of the firms having five employees or less.

The largest number of firms and the largest number of Component Manufacturing jobs were with firms that manufacture all other plastic products, with 17 percent of the total firms and 14 percent of the total employment (11,267 employees). Other types of firms with a significant share of employment were semiconductor manufacturers (6,973 employees), sheet metal work (5,492 employees) and motor vehicle electrical/electronic equipment manufacturers (4,901 employees).

Industry Situation. As one recent report states, “With the emergence of the global economy, many policy makers assume that these once plentiful and high-paying manufacturing jobs will not be returning to New York State.” (Office of the State Comptroller) However, the same report notes that, despite job losses, manufacturing remains an important component of the economy, particularly the upstate economy. Many national and state experts believe that the manufacturing decline may have reached a plateau.

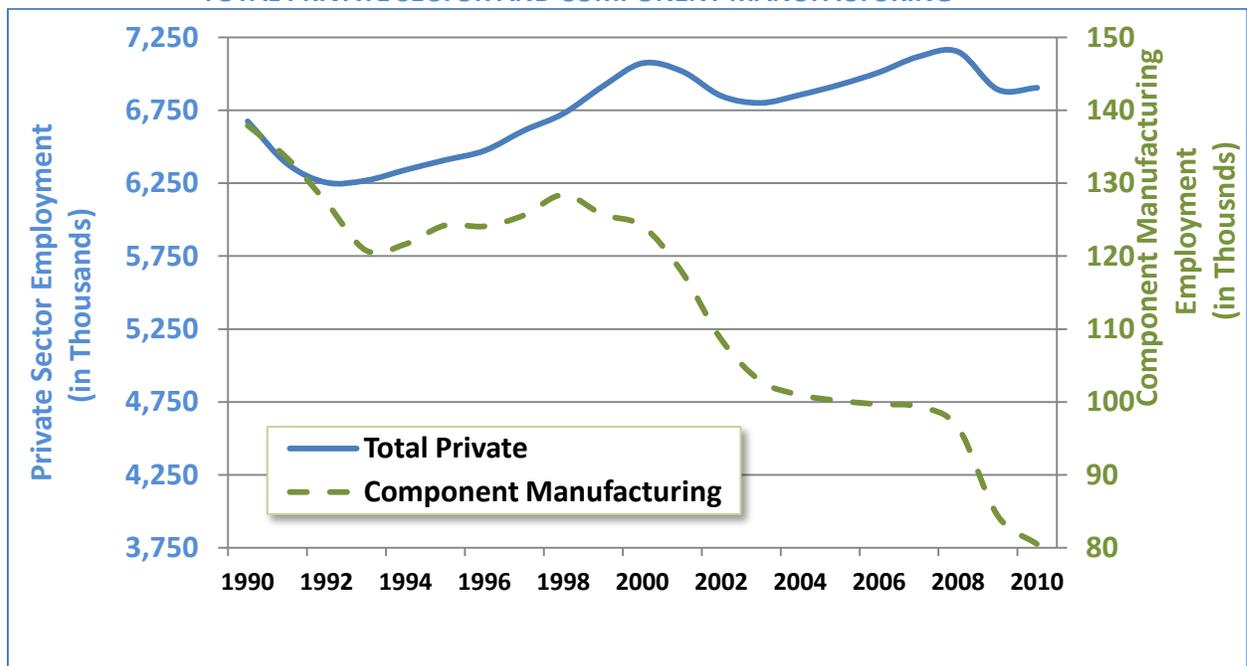
Manufacturing firms and the jobs within them tend to be more highly technical and higher paying. In a study of skill-upgrading within the manufacturing workforce nationwide, researchers at the Federal Reserve Bank found that practically all manufacturing industries have become higher-skilled industries. The recently formed (2011) Regional Economic Development Councils in New York State are trying to bring academic institutions and industry leaders together to further key industries in each region of the state. In some regions, these Councils will focus on manufacturing, especially high-tech or advanced manufacturing, which require a skilled and educated workforce.

According to a report issued by the New York Industrial Retention Network in 2009, New York City's remaining manufacturers say that they want to be in close proximity to clients and supply chain, appreciate the availability of skilled/semi-skilled labor and feel

they can provide better supplier customer service by being in the City (NYIRN, 2009). Surveyed by Halcrow in 2009, New York City manufacturers listed real estate and facility costs, energy utilities costs and insurance costs as the greatest challenges to doing business in NYC (NYIRN, 2009).

Recent Developments. As demonstrated in the chart below, employment in the Component Manufacturing cluster has generally declined over the last 20 years and has lost about 60,000 jobs since 1990. The reduction in manufacturing employment in New York State and City has mirrored national trends, and is similar to other states with urban centers in the northeast, Midwest and on the west coast. New York City, in particular, has transitioned from an industrial to a post-industrial economy. The reasons are many and include broad technological changes, improvements in transportation, changes in mass production technology, and movement of production to areas with lower business costs, including land, utility and labor costs, and, in some cases, less environmental regulation or lower tax rates.

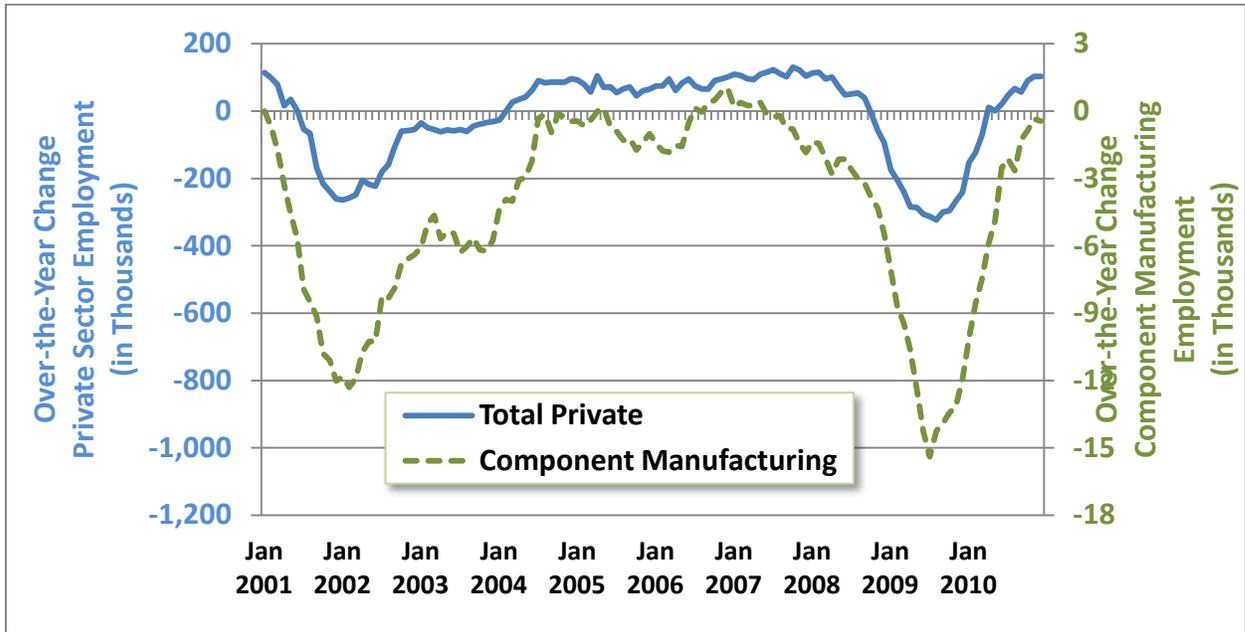
**ANNUAL PAYROLL EMPLOYMENT IN NEW YORK STATE
TOTAL PRIVATE SECTOR AND COMPONENT MANUFACTURING**



SOURCE | QCEW 1990 to 2010 Annual Average Employment

As the chart on the next page illustrates, component manufacturing employment is more cyclical than overall private sector employment but has tended to lose jobs in all economic cycles.

YEAR-OVER-YEAR CHANGES: TOTAL PRIVATE AND COMPONENT MANUFACTURING



SOURCE | QCEW Monthly Over-the-Year Change

Wages. The chart below lists the median annual wages in New York State and typical preparation needed for occupations in the Component Manufacturing cluster. Note that this chart includes only occupations commonly found in the green economy, according to O*NET’s *Greening of the World of Work*.²

WAGES AND TYPICAL PREPARATION FOR GREEN COMPONENT MANUFACTURING OCCUPATIONS

Occupation	Median Pay	Typical Preparation
Electrical Engineers	\$83,080	Bachelor’s degree
Electronics Engineers, Except Computer	\$89,300	Bachelor’s degree
Environmental Engineers	\$81,230	Bachelor’s degree
Industrial Engineers	\$77,550	Bachelor’s degree
Mechanical Engineers	\$74,800	Bachelor’s degree
Sales Engineers	\$90,180	Bachelor’s degree
Software Developers, Applications	\$92,470	Bachelor’s degree
Civil Engineers	\$78,570	Bachelor’s degree
Electrical and Electronic Engineering Technicians	\$57,300	Associate degree
Environmental Engineering Technicians	\$41,300	Associate degree
Mechanical Engineering Technicians	\$48,960	Associate degree
First-Line Supervisors of Building and Grounds Cleaning and Maintenance	\$27,250	Work experience in a related occupation
First-Line Supervisors of Production and Operating Workers	\$58,090	Work experience in a related occupation
Industrial Production Managers	\$92,840	Work experience in a related occupation
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	\$59,850	Work experience in a related occupation
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	\$81,520	Work experience in a related occupation

² Dierdoff, E., J. Norton, D. Drewes, et al., *Greening of the World of Work: Implications for O*NET-SOC and New and Emerging Occupations*, National Center for O*NET Development, 2009. They

Occupation	Median Pay	Typical Preparation
Drafters	\$51,500	Postsecondary vocational award
Heating, Air Conditioning and Refrigeration Mechanics and Installers	\$51,060	Postsecondary vocational award
Welders, Cutters, Solderers, and Brazers	\$36,090	Postsecondary vocational award
Assemblers and Fabricators, All Other	\$24,520	Moderate term on-the-job training
Customer Service Representatives	\$33,900	Moderate term on-the-job training
Insulation Workers, Floor, Ceiling and Wall	\$33,100	Moderate term on-the-job training
Production, Planning and Expediting Clerks	\$46,470	Moderate term on-the-job training
Computer-Controlled Machine Tool Operators, Metal and Plastic	\$33,610	Moderate-term on-the-job training
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	\$28,750	Moderate-term on-the-job training
Inspectors, Testers, Sorters, Samplers, and Weighers	\$34,470	Moderate-term on-the-job training
Installation, Maintenance, and Repair Workers, All Other	\$39,720	Moderate-term on-the-job training
Team Assemblers	\$25,510	Moderate-term on-the-job training
Machinists	\$40,440	Long-term on-the-job training
Sheet Metal Workers	\$46,770	Long-term on-the-job training
Structural Iron and Steel Workers	\$77,540	Long-term on-the-job training
Tool and Die Makers	\$49,160	Long-term on-the-job training
Electrical and Electronic Equipment Assemblers	\$29,070	Short-term on-the-job training
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	\$27,250	Short-term on-the-job training
Packaging and Filling Machine Operators and Tenders	\$23,840	Short-term on-the-job training

SOURCE | Occupational Employment Survey; O*NET Online.

Manufacturing offers jobs at all skills levels – low, moderate and highly technical. The median wage in manufacturing in New York City is 30 percent to 50 percent greater than wages for retail or service workers. (NYIRN, 2009) In upstate New York, the pay scale is 40 percent above the average wage. (NYS DOL)

Employment Projections. Employment in Component Manufacturing is projected to shrink by 0.9% in New York State between the years of 2008 and 2018. This compares to growth of 0.5% in total nonagricultural wage and salary jobs.

Demographic Trends. The following chart displays the demographic characteristics of the Component Manufacturing workforce from 2000 to 2007-2009. Statewide, the Component Manufacturing workforce contracted by 16 percent; employment in New York City declined by 5 percent during the same time period. The vast majority of the Component Manufacturing workforce lives upstate. The statewide workforce is predominantly male and white; the workforce in New York City is mostly male but is racially and ethnically diverse. Throughout the state, the manufacturing workforce is aging, as almost 60 percent are 45 years of age or older. On a statewide basis, a small proportion of the workforce (14%) has less than a high school degree, although this percentage is much higher in New York City (25%). Almost all of those who work in the industry (96%) in New York State also live in the state. Four in five people who work in the sector in New York City live in the City.

DEMOGRAPHIC CHARACTERISTICS OF THE COMPONENT MANUFACTURING WORKFORCE

	New York State		New York City	
	2000	2007-09	2000	2007-09
Total Workforce	98,784	84,130	14,185	13,101
New York State/City Residents	95,278	80,413	10,960	10,337
Non-New York State/City Residents*	3,506	3,717	3,225	2,764
New York City	14%	16%	<i>na</i>	<i>na</i>
Long Island	12%	13%	<i>na</i>	<i>na</i>
Hudson Valley	9%	7%	<i>na</i>	<i>na</i>
Upstate	65%	63%	<i>na</i>	<i>na</i>
Bronx	<i>na</i>	<i>na</i>	18%	13%
Kings	<i>na</i>	<i>na</i>	32%	37%
New York	<i>na</i>	<i>na</i>	11%	9%
Queens	<i>na</i>	<i>na</i>	36%	38%
Richmond	<i>na</i>	<i>na</i>	3%	4%
Male	71%	72%	73%	72%
Female	29%	28%	27%	28%
White	78%	77%	31%	38%
Black	6%	5%	15%	13%
Hispanic	11%	12%	41%	30%
Asian	3%	5%	8%	17%
Other	2%	1%	5%	3%
Age 18-34	30%	22%	33%	24%
35-44	28%	19%	25%	18%
45-54	27%	37%	25%	33%
55+	15%	22%	18%	26%
Less than high school or GED	16%	14%	34%	25%
High school or GED	35%	34%	28%	32%
Some college	30%	29%	23%	25%
College or More	19%	23%	15%	18%

SOURCE | U.S. 2000 Decennial Census and 2007, 2008, and 2009 American Community Surveys public use microdata (PUMS) files.

*The remaining counts that appear in the table are of people who both live *and* work in New York State and City, respectively.

Green Economic Activity in Component Manufacturing

For the purposes of the current green jobs research, green economic activity in Component Manufacturing has been defined to mean the production of goods that contribute to increasing energy efficiency or producing renewable energy. Examples include:

- Manufacturing components or equipment for renewable energy generation and distribution, e.g. wind turbines, solar panel components, controls and devices
- Manufacturing energy efficiency products, e.g. boilers, furnaces, windows, doors, insulation, electrical devices
- Manufacturing products for retrofitting or improving energy efficiency in buildings or facilities

- Manufacturing motor vehicle equipment, including batteries and railroad rolling stock

While not within the scope of this green jobs study, the researchers are aware that within the context of New York City manufacturing and elsewhere in the state, green manufacturing may refer to both green practices such as the use of more energy efficient machines and lighting, waste reduction, pollution prevention, energy conservation and use of renewable energy sources for production needs, as well as the production of green products, such as those made from recycled materials (glass, cardboard, paper) or from sustainably-sourced materials (wood used in furniture, organic cotton) or environmentally-friendly materials, i.e. varnishes used in furniture. It is also taken to include organic produce and food.

There are a number of positive developments related to green Component Manufacturing in upstate New York State.

- The Solar Energy Consortium was founded in 2007 and is based in Kingston, NY in the Hudson Valley region of the state. In addition to advancing solar installation, the organization has as one of its main goals to create a solar R&D and manufacturing cluster in New York State. It has brought together industry, academic, and economic development partners to try to accomplish this. There is now a cluster of solar businesses, including manufacturers, in the Kingston area with high-skill R&D and manufacturing jobs.
- General Electric (GE) has established its global renewable energy headquarters in Schenectady, and will monitor wind turbines across the country from this facility. In addition, GE Transportation, a business unit of GE, is building a manufacturing plant in the Albany area that will make advanced storage batteries using sodium-metal halide technology. These batteries are for use in hybrid-electric applications such as mining trucks, tugboats and hybrid locomotives. Other applications include backup storage and load leveling for smart grid.
- Global Foundries is building a new semi-conductor manufacturing facility in Malta, NY, in Saratoga County. Global Foundries is one of the largest computer chip manufacturers in the world.
- The Tech Garden in Syracuse, NY is a multipurpose organization trying to bring clean tech and other technology businesses to central New York. Recently, the Canadian company ProTerra (an LED lighting manufacturer) announced that it will locate a sales and marketing workforce, and possibly later an engineering, assembly and testing center in Tech Garden in downtown Syracuse. A German company, Sun Energy Europe will locate the headquarters of Sun Energy Americas in Syracuse.
- SunMaxx Solar, headquartered near Binghamton, NY, designs and manufactures solar thermal hot water and heating systems. It has a large thermal logistics center in Binghamton.

- Globe Specialty Metals re-opened its plant in Niagara Falls to make purified silicon for solar panels. It is hoped that this will attract solar panel manufacturers to the region.

THE BROOKLYN NAVY YARD

The Brooklyn Navy Yard is one of New York City's 16 Industrial Business Zones. The Brooklyn Navy Yard Development Corporation (BNYDC), a not-for-profit corporation, manages the Yard under a contract with the City of New York, which owns the property. BNYDC is responsible for leasing space in the Yard, developing the underutilized areas of the Yard, and overseeing the ongoing modernization of the Yard's infrastructure. BNYDC is pursuing its mission to create and retain industrial jobs in New York City with a strong commitment to environmental sustainability.

It explicitly wants to be the destination of choice for green manufacturers and businesses, and illustrates an approach to "green" or sustainability that includes both products and practices. The BNYDC has set goals to develop a coordinated green strategy to stabilize and reduce the Yard's carbon footprint, position the Yard to be a national model for sustainable industrial parks, and establish the Yard as an attractive location for green manufacturers and businesses (Brooklyn Navy Yard).

Key initiatives include:

- Requiring new buildings and major renovations to be certified LEED Silver or better
- Constructing the first multi-tenant industrial LEED Silver buildings in the US, including NYC's first wind turbines
- Reusing Navy-built buildings for their original industrial intent; a new museum will have a geothermal heating system
- Using green technologies for renovations and maintenance, i.e. Energy Star roofs, experimenting with green roofs, energy efficient windows and light bulbs
- Undertaking a major infrastructure project involving a major water/sewer upgrade, improving water conservation, and rebuilding the road system with improved storm water management systems, expanding landscaping with water-loving plants, and using permeable asphalt
- Purchasing hybrid and low-emission vehicles for the Yard's fleet; operating a shuttle system to the subway station using diesel-powered buses
- Installing solar-powered trash compactors and exploring use of solar-powered street lamps
- Using eco-friendly cleaning products
- Installing bicycle racks (designed in the shape of ships by one of the Yard's tenants and made from recycled material) and lanes
- Providing setbacks along the perimeter of the Yard to enable the first phase of the Brooklyn Waterfront Greenway for bicyclists and pedestrians
- Submetering all tenants and billing them for electricity use
- Establishing a tenant sustainability committee
- Developing a new waste management system, including the re-use of some industrial waste

One large building (Building 128) is being renovated and positioned as a green manufacturing center. As evidenced by the Yard's *Green Business Directory* (Brooklyn Navy Yard), there is already a clustering of green companies. The hope is that entrepreneurs will be attracted there and create new jobs.

Green Market Drivers. As one representative of a Long Island manufacturer that participated in a focus group for this research expressed it, “Before we can have occupations [in the energy industry] we need companies that can hire people, and before companies can hire people, there has to be a need for that company’s services and products in a demand driven market.” A New York City industry expert made the same point, that in order to have “green job creation” there must be entrepreneurs creating the jobs. Some experts believe that it is a challenge to attract that type of firm. A number of New York State entities have made efforts to support green manufacturing in the state. Several companies have received financing from the Empire State Development Corporation. Others have been assisted by the New York Power Authority, NYSERDA, the New York State Department of Labor and the cities or counties in which they are located.

Manufacturing employers that participated in a focus group conducted as part of this research also mentioned the following factors:

- “It all comes down to economics.” Some mentioned that high energy costs drive demand for their products and services. One company that is involved in converting vehicles to hybrid electric power said, “People must understand that they [fleet operators] are spending a huge portion of their operating capital on fuel.” Another example of “economics” is the cost to the consumer of switching to renewable energy sources. The cost of renewable energy (e.g. solar) must be competitive. Another company representative said, “High [conventional] energy costs drive demand for services in this industry.” Another said, “You don’t sell the ‘green,’ you sell the technology and the benefit.”
- “Present financing options are virtually non-existent.” One company representative said that financing is critical to moving energy management projects forward. Another added “if the credit is there to do these kinds of projects then businesses will grow and hire people.”
- Need for greater consistency in rules and legislation. One Long Island manufacturer pointed out that there are nearly 150 local municipalities on Long Island, each with its own set of rules for renewable energy installations, and that “permitting is unclear.” These inconsistencies “slow things down and create other hurdles that are impediments to business, which makes rolling out a technology very difficult...and leads to all sorts of extra cost and resistance.” This same general point has been made in New York City.
- Need for stronger fuel economy and air quality laws. Stricter standards would create a demand for technologies and products to address these issues.

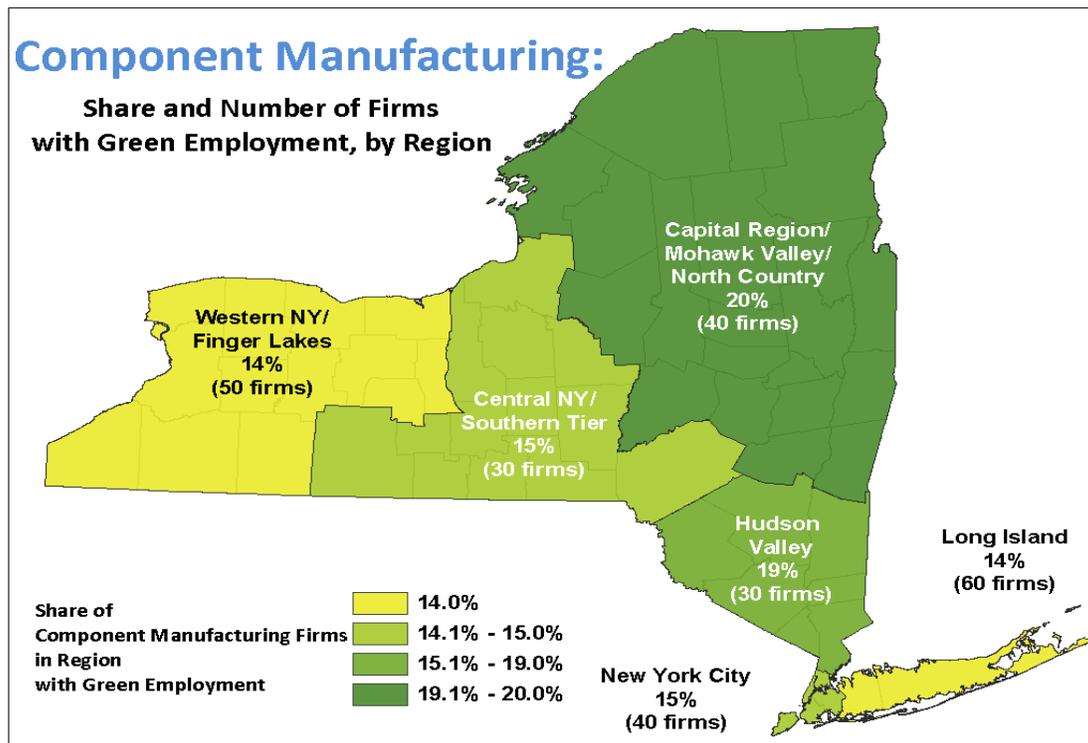
- Workforce quality. A business that recently moved to the Syracuse area said that the area’s well-educated workforce and commitment to business growth were pivotal in the company’s decision to base U.S. operations in the area.

Whatever the drivers of green manufacturing, the sector still exists within the overall economy, which is experiencing a weak economic recovery and limited job growth.

Green Employment in Component Manufacturing

Firms and Employment: Survey Results

Statewide, 16 percent of firms in the Component Manufacturing cluster report that they have one or more green employees. The map and chart below display the findings by region.

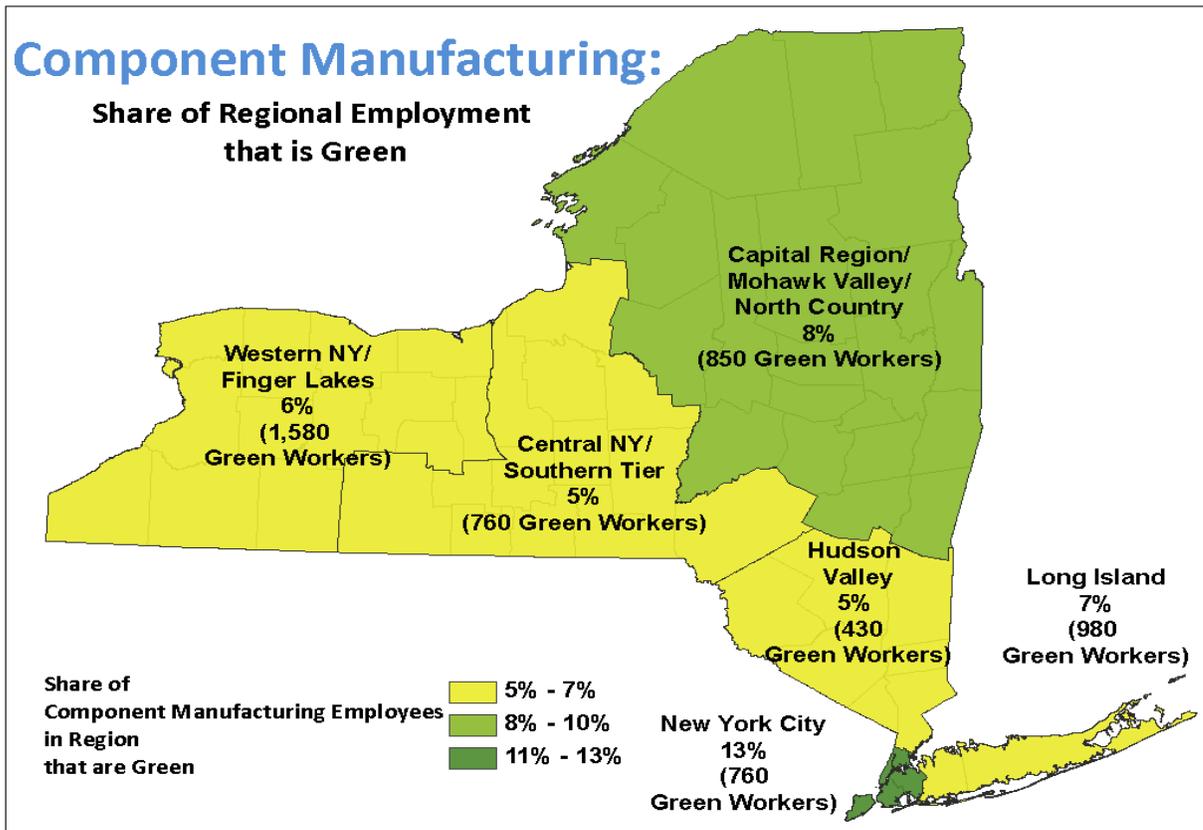


Firms	New York State	New York City	Long Island	Hudson Valley	Capital Region/ Mohawk Valley/ North Country	Central NY/ Southern Tier	Western NY/ Finger Lakes
Number with Green Employees	260	40	60	30	40	30	50
Total Number in Cluster	1,660	280	410	170	200	210	170
Percent with Green Employees*	16%	15%	14%	19%	20%	15%	14%

In Component Manufacturing, due in large part to the small number of green firms statewide, very few significant regional differences arise. Generally, firms with green employment are fairly evenly distributed across the six regions.

Across the state, the proportion of regional employment that is green does not vary widely. Component Manufacturing workers in New York City are slightly more likely to be green than similar workers in regions outside the city.

Western NY/ Finger Lakes region has 1,580 green Component Manufacturing workers, the highest regional number by far. But these green workers account for only 6 percent of all workers in the cluster in that region.



	New York State	New York City	Capital Region/ Mohawk Valley/ North Country	Hudson Valley	Central NY/ Southern Tier	Long Island	Western NY/ Finger Lakes
Green Employment	5,360	760	850	430	760	980	1,580
Regional Employment	80,450	5,750	11,040	8,820	16,820	13,700	24,280
Percent Green*	7%	13%	8%	5%	5%	7%	6%

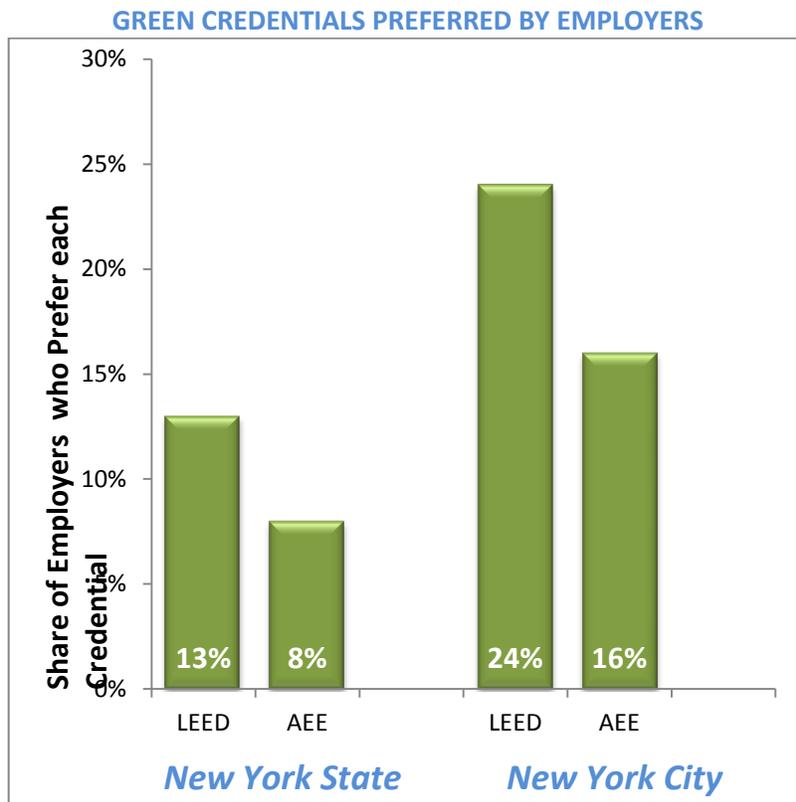
Firms with green employees were asked whether they expected their green employment to be larger, smaller or unchanged a year later. Of the 260 Component

*Percentages are calculated from unrounded data.

Manufacturing firms with green employment, 81 percent expected their green employment to grow larger (42%) or remain unchanged (39%).

Firms without green employees were asked whether they expected to have green employment a year later. In answer to this question, 70 percent of the 1,660 firms without green employment said they did not expect any change, 3 percent expected to have green employees a year later, and 27 percent were not sure.

Preferred Credentials for the Green Workforce. Employers who responded to the survey were asked what, if any, green credentials they prefer their green employees to have. As shown in the bar graphs below, 13 percent of the employers with green employees in New York State preferred a Leadership in Energy and Environmental Design (LEED) credential, and eight percent preferred an Association of Energy Engineers (AEE) credential. For New York City, the proportions were higher, with 24 percent preferring LEED and 16 percent preferring AEE.



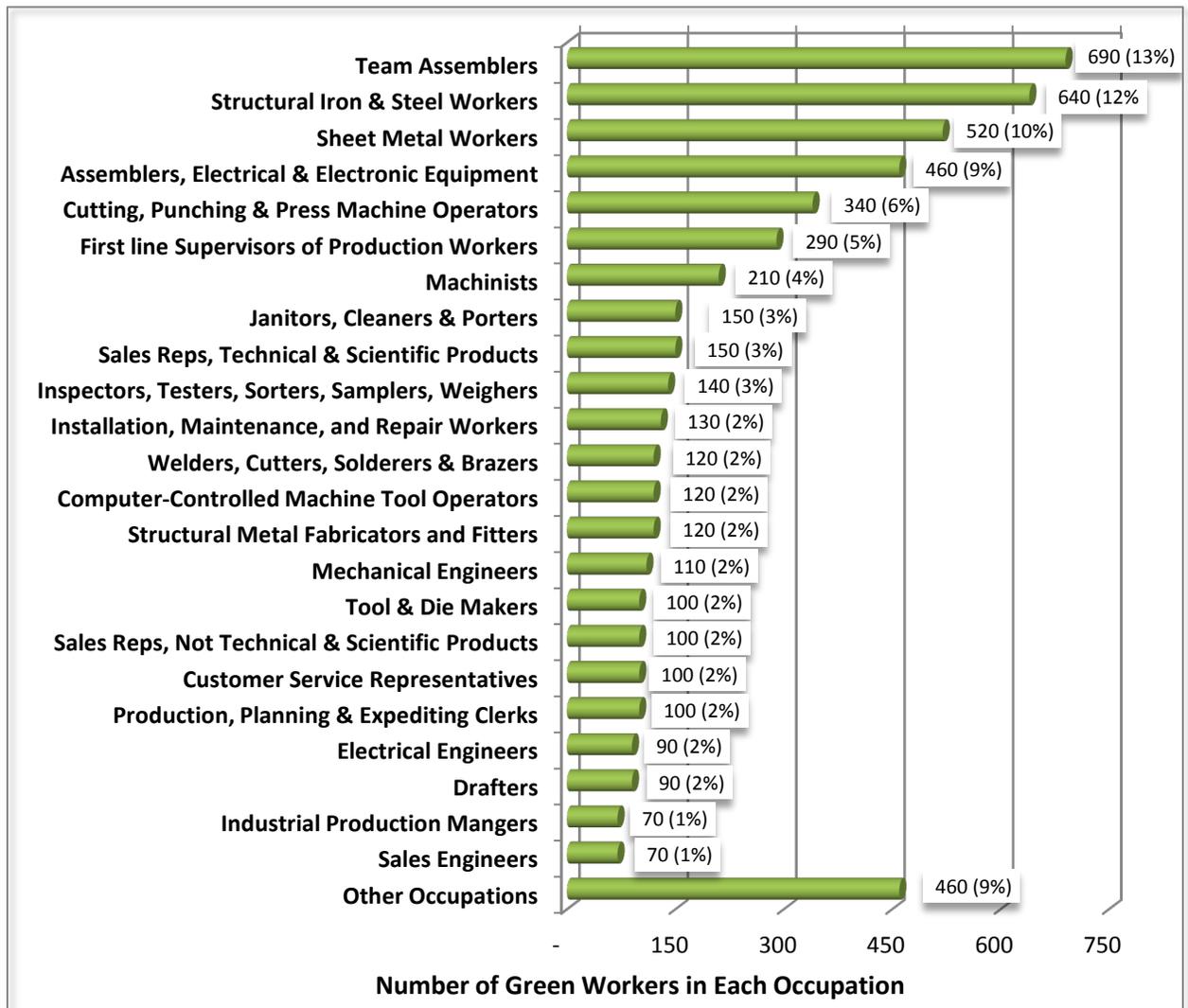
Focus groups and interviews with industry employers validated this response. Several indicated that being conversant in LEED helps, especially in understanding what types of products earn LEED points in building construction and retrofits. One company representative said that his company's acoustical noise reduction applications have

earned LEED points because they improved the environment of the space. Another company mentioned that AEE credentials are recognized for Energy Engineers, an example being the Certified Energy Manager (CEM).

Occupational Information

Key Occupations. As shown in the chart below, the statewide employer survey found that the five most common occupations with green employment in Component Manufacturing are: Team Assemblers; Structural Iron and Steel Workers; Sheet Metal Workers; Electrical and Electronic Equipment Assemblers; and Cutting, Punching and Press Machine Operators (Metal and Plastic). These five occupations account for half of the cluster’s green employment.

GREEN OCCUPATIONS IN THE COMPONENT MANUFACTURING CLUSTER



‘Other Occupations’ includes job titles that individually account for less than 1% of the total green employment in Component Manufacturing. These occupations, such as Civil Engineers, Electricians, and Environmental Engineers, together make up 9% of green employment in this industry cluster.

Career Pathways. One employer explained that his business needs a team effort from people with different disciplines, from technicians to electrical engineers, energy engineers and systems engineers. People in all of these disciplines need to be able to demonstrate the benefit of his company’s devices (control and monitoring applications) to the customer and be successful in creating a project. Another company in the geothermal business takes its installation workforce from those with classic HVAC installer experience and gives them training in the new technology that it produces.

Recruitment, Retention and Turnover. As part of the employer survey, firms with green employment were asked whether they have difficulty recruiting qualified workers. Of the 260 green firms in Component Manufacturing in New York State, 34 percent (90) have difficulty recruiting qualified green workers, including 19 percent that have difficulty recruiting for more than one occupation.



- The occupation for which employers have the most difficulty finding qualified candidates is Structural Metal Fabricators and Fitters, where 58 percent of firms (10 firms) report this issue. The second most frequent occupation with recruiting difficulties was Mechanical Engineers, where 52 percent, or 20 firms, report this difficulty. Occupational recruiting difficulties varied by region, however. The occupations where 15 percent or more of employers had difficulty finding qualified green workers were:
 - Capital Region/Mohawk Valley/North Country: Electrical Engineers (64%), Mechanical Engineers (81%) and Sales Reps, Technical & Scientific Products (36%)
 - Central New York/Southern Tier: no recruiting difficulties
 - Hudson Valley: no recruiting difficulties
 - Long Island: Mechanical Engineers (77%), Sales Engineers (68%), Assemblers, Electrical & Electronic Equipment (31%)
 - New York City: First line Supervisors of Production Workers (29%)
 - Western NY/Finger Lakes: Sales Reps, Not Technical & Scientific (100%), First-line Supervisors of Production Workers (19%), Computer-Controlled Machine Tool Operators

Component manufacturers that attended a focus group for this research on Long Island noted difficulty recruiting Power Engineers. One said that “the few we work with have

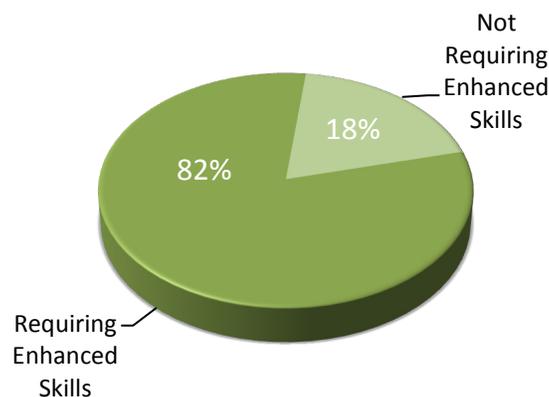
been in the industry for 40 to 50 years and won't be around much longer; they want to retire." Another mentioned that the New York area is lacking in electrical engineering staff, both power and analog.

Another Long Island manufacturer of wireless web-enabled communication technologies stated that they need Energy Engineers who really understand the incentive programs that are run by the State and who also have an in-depth understanding of the heating systems in buildings.

In terms of general recruitment of new employees, several firms said that their web pages are recruiting tools at all levels. They note that because they are green companies, people want to work for them because they are seen as innovators. One employer recruits through one of the local community colleges and finds this is a good fit for his company. Most manufacturers are small companies.

Training and Educational Preparation. Employers were asked in the statewide survey how many of their employees required new skills to be able to perform their work in a green economy, and of those that required skills, where they were acquired. A very strong majority, more than four in five green employers in the Component Manufacturing cluster, required employees to have enhanced skills to produce green products.

PERCENTAGE OF EMPLOYERS REQUIRING ENHANCED SKILLS FOR GREEN WORKERS

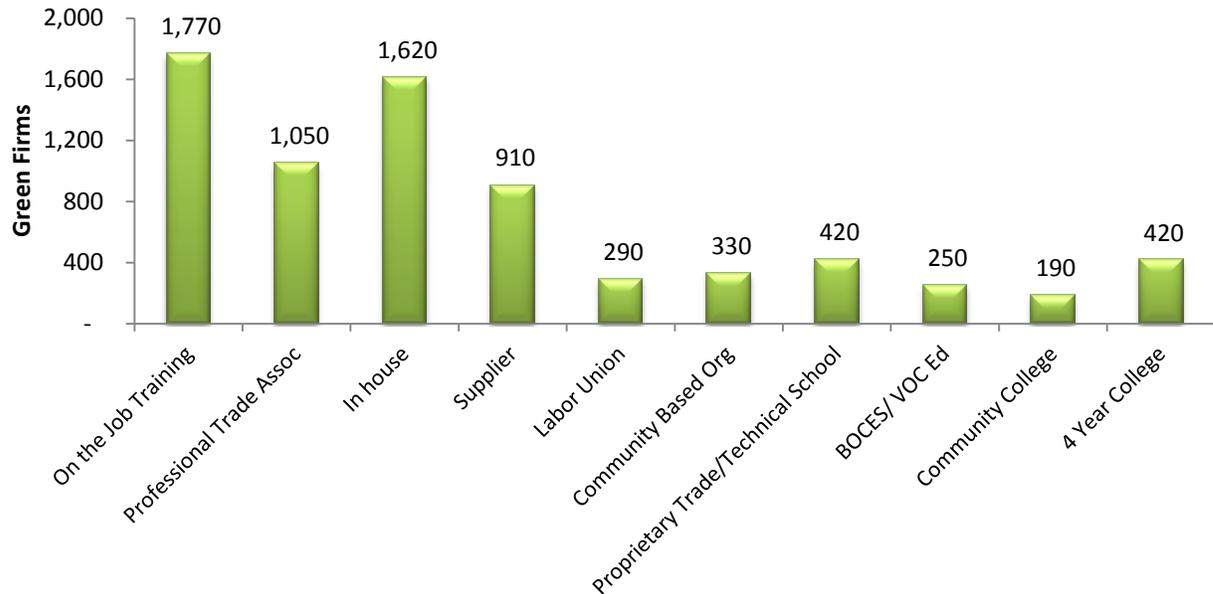


As the chart on the next page displays, the sources of enhanced skills used by employers ranges from 'On-the-Job Training' to 'Four Year College'.

Common sources of training include 'On-the-Job Training' (160) and 'In-house' (130) in Component Manufacturing.

Companies that participated in focus groups mentioned both on-the-job training and training from industry trade associations. Manufacturers work with dealers and installers, who often have the responsibility for making sure that its employees have the training, whether acquired on their own or through their employers.

SOURCES OF ENHANCED SKILLS TRAINING



Recommendations for Education and Training Providers. Employers that took part in focus groups were asked what they would change about the way colleges, community colleges and training institutions prepare students for the workforce. Their suggestions were:

- *More cross-functionality.* Employers say they need “engineers with stronger people skills and sales and marketing employees with stronger critical and analytical reasoning skills.” They say that “this is necessary in order for companies to be able to grow, innovate and meet the demands of a market without impacting with quality or reputation when it comes to development and being able to push the market forward.”
- *Prepare people for the workforce as well as educating them in the subject matter.* Employers believe that universities need to incorporate business practices and input into the university structures. They feel that students at all levels – including PhD level students – know their subject matter but are not prepared for the workforce. As one company representative said, “Once they’re in the workforce they see what they are lacking. There is definitely a flaw in the system.”
- *More hands-on learning.* As one employer said, “the next best thing to a project that can be started is a project that has already been performed. Taking all the parts involved, knowing exactly how they went in and what was required, is probably the easiest way to structure a curriculum for a building.”

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