What is Advanced Manufacturing?

Some experts define advanced manufacturing as a new way of accomplishing the “how to” of production, where the emphasis is on customization and scalability, while advancing the technologies necessary to improve capabilities. Paul Fowler of the National Council for Advanced Manufacturing (NACFAM) defines advanced manufacturing as an entity that:

“Makes extensive use of computer, high precision, and information technologies integrated with a high performance workforce in a production system capable of furnishing a heterogeneous mix of products in small or large volumes with both the efficiency of mass production and the flexibility of custom manufacturing in order to respond rapidly to customer demands.” (PCAST)

Why Advanced Manufacturing?

The manufacturing sector is critical to California’s economy. For every one job created in manufacturing, at least two and a half jobs are created to support the sector. Further, manufacturing firms create regional wealth by producing a product that is exported across the state, nation and/or world. This attracts additional funds to the region — building wealth for businesses, individuals and community. Because of this ripple effect, manufacturing firms have a deeper impact on the state of the economy than most other industries.

Quick Facts

→ There are about 64,000 manufacturing businesses in California.
→ The manufacturing sector accounts for 1.3 million jobs in California or about 7% of the state’s employment across all sectors.
→ While manufacturing experienced an overall loss of jobs in 2011-2012 (-3,276 jobs), sectors such as food manufacturing and biotechnology actually added jobs (4,104 and 3,232 respectively).
→ Revenue generated by manufacturing sector in 2011 totaled $341 billion.
→ The 2012 average sector earnings per worker (EPW) for manufacturing was $92,532 — 62% more than the average EPW across all sectors in California.

What is Driving Growth?

challenges

• Employers report that California’s regulatory climate is difficult, expensive and time consuming to navigate, such as conducting environmental impact studies or obtaining permits.
• When competing with other low-cost economies, California manufacturing firms have
  …higher health care expenditures,
  …higher salaries and other benefits,
  …higher environmental compliance costs,
  …higher corporate tax rates
• U.S. manufacturers report a shortage of skilled production workers (machinists, operators, etc.) which hinders their ability to expand operations or improve productivity.

opportunities

• Outsourcing costs are often underestimated.
• Benefits to working local include
  …improved quality and consistency of inputs;
  …ability to create just-in-time operations; and
  …reduction of intellectual property theft issues
• As this viewpoint gains popularity, it will shift production back to the United States, creating jobs and wealth in the process.
• As firms now expect employees to apply scientific and technical principles to structures and processes, many manufacturing jobs require postsecondary education, skills certification, and/or credentials.
What is the Industry Outlook?

In California, the manufacturing sector contributes more than 1.3 million jobs to the State’s economy. The largest manufacturing clusters by number of jobs are Computer/Electronics, Food Processing, Aerospace, Biotechnology, Building Materials, and Fashion/Clothing. Each of these clusters has a projected five-year loss of new jobs, with the exception of biotechnology.

The graph below demonstrates sector “winners” and “losers” by the number of jobs gained or lost in the one year period, 2011-2012. Clusters showing signs of recovery and growth are food manufacturing, biotechnology, fashion, machinery, chemical manufacturing, and aerospace. Collectively, these clusters added nearly 12,000 new jobs in 2011-2012. Industries with a loss of new jobs include, printing, building materials, and transportation.
What Clusters are Driving Economic Activity?

The Los Angeles and Central regions lead the state in manufacturing revenue. Sales in the manufacturing sector have a significant impact on the economy. Not only does revenue generated contribute to the state through sales taxes, corporate taxes, etc., it also generates a higher level of activity among firms in the supply chain than other sectors. This equates to more employment and state tax revenue as manufacturing clusters grow and prosper. In terms of total manufacturing jobs, the Los Angeles region has by far the most (381,329 jobs), with Orange County (168,011) and Silicon Valley (154,392) contributing a substantial amount of jobs.

Where are the “Hot Spots”?

The Los Angeles/Orange region is home to about 28,800 firms, roughly 60% of all manufacturing establishments in the state and leads in jobs and revenue as well. Other regions with significant manufacturing employment include Silicon Valley, East Bay, San Diego, Central, and Inland Empire. The cluster composition differs from region to region — for example, while computer/electronics drive growth in the Silicon Valley, the biotechnology cluster is critical for San Diego/Imperial, and food manufacturing leads the sector in Central Valley.
How Much Does It Pay?

Manufacturing is one of the top paying sectors in California. With the annual sector earnings per worker at $92,532, manufacturing pays 62% higher wages than the average across all other sectors in the state. Earnings in the manufacturing sector vary significantly by cluster. The highest average wages are offered to workers in petroleum ($280K), biotechnology ($122K), computers ($111K), aerospace ($105K), and machinery ($923). Clusters that pay lower wages include fashion/clothing, printing, furniture, and household products.

What Jobs are in Demand?

Jobs that are projected to be in high demand in the next three years represent a mix of occupations requiring some level of vocational training, work experience, and Bachelor’s degree. Most openings will be created to replace the “graying” workforce. This underscores the importance for community colleges to train entry level workforce to meet the challenges of advanced manufacturing and also prepare students for higher-level careers in the sector. The table below presents the top ten occupations in the manufacturing sector with the most job openings by 2015.