



## California's Top Manufacturing Clusters

### **Center of Excellence**

Los Rios Community College District

### **Center for Applied Competitive Technologies**

El Camino College



This report was prepared by the Center of Excellence at Los Rios Community College District and the Center for Applied Competitive Technologies (CACT) at El Camino College.

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Economic and Workforce Development Program

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## Introduction

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.<sup>1</sup> 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 proprietor, individual and community wealth. Because of this ripple effect, manufacturing firms have a deeper impact on the state of the economy than most other industries.

The purpose of this study is to identify the top manufacturing clusters in California, including employment, revenue and workforce trends as well as geographic concentrations. This information will be used by the California Community College's Centers for Applied Competitive Technologies (CACT) to determine how to best serve the industry. The CACT offers technology education, manufacturing training, and consulting services that contribute to continuous workforce and business development, and technology deployment.<sup>2</sup>

## Overview

In the last five years, the manufacturing sector lost 14% of its job base, down from 1.6 million jobs in 2006 to 1.4 million jobs in 2011. However, in 2010, the manufacturing sector began adding employment, regaining 15,000 jobs.<sup>3</sup> California exports have also increased — up from \$104 billion of manufactured goods in 2009 to \$124 billion in 2010.<sup>4</sup> Although it is too early to determine, this may be an indicator that the manufacturing sector is gaining momentum.

To encourage growth, the manufacturing sector must address a variety of challenges, from navigating a complex regulatory environment to developing strategies to compete with low cost economics. National, state and local legislators can support the sector by developing and adopting policies that eliminate barriers to success and create incentives for local production. This sector reviews some of the sector's major challenges as well as a few opportunities that may help drive growth in the future.

## Challenges

There are a number of factors that have inhibited the manufacturing sector's ability to compete locally and internationally. Some of these challenges include:

- Complex regulatory environment. Employers have communicated that California's complex regulatory climate is difficult, expensive and time consuming to navigate, such as conducting environmental impact studies or obtaining permits.<sup>1</sup>
- International competition from low-cost economies such as China, Singapore, South Korea, Russia, etc. According to a 2009 study, California manufacturing firms have:<sup>5</sup>
  - Higher health care expenditures compared to countries where health care is paid for by general tax revenues;
  - Higher salaries and other benefits, such as paid leave, insurance, and retirement plans;
  - Higher costs associated with litigation claims;
  - Higher costs associated with environmental compliance;
  - Higher corporate tax rates than most other countries (the United States' tax rate is 40%, the second highest tax rate among major trading partners.)

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<sup>1</sup> Manufacturing 2.0: A More Prosperous California

<sup>2</sup> More information about the CACTs can be found in Appendix B.

<sup>3</sup> EMSI Complete Employment – 2011.4

<sup>4</sup> International Trade Administration. 2010 data is the most recent data available. The computers and electronics industry exported the most goods (in terms of total dollar value), followed by machinery and transportation equipment.

<sup>5</sup> The Facts About Modern Manufacturing, 8<sup>th</sup> Edition

- U.S. competition. In addition to international competition, California based manufacturers are targets of state government programs to recruit manufacturers from California through incentive and off-set programs.<sup>6</sup> These programs target high wage jobs that will most likely not return to California.
- U.S. high school students lag behind in math and science based on Program for International Student Assessment (PISA) test scores.<sup>7</sup>
- U.S. manufacturers report a shortage of skilled production workers (machinists, operators, craft workers, etc.) which is hindering their ability to expand operations or improve productivity.<sup>8</sup>

## Opportunities

Competition from low-cost economies is one of the major challenges faced by the manufacturing sector. However, the total cost of outsourcing to other countries is often miscalculated. According to the Reshore Initiative, the sticker price provided by out-of-the-county manufacturing firms does not include costs associated with:

- National policy issues (trade negotiations, etc.),
- Changes in currency exchange rates,
- Trade secret thefts,
- Supply chain disruptions,
- Lengthy delivery times, and
- Traveling to the manufacturing site to assess and resolving production issues.

Further, in the last few years many countries have started to raise their prices to adjust for increases in wages and higher transportation/fuel expenses. By examining the total cost of outsourcing, the Reshore Initiative argues that hiring local production firms is just as price sensitive as hiring firms from low-cost economies. Also, there are several benefits to working local, such as

- Improved quality and consistency of inputs;
- Ability to create just-in-time operations that reduce costs and improve business-to-business relations; and
- A reduction of issues related to securing intellectual property.<sup>9</sup>

As this viewpoint gains popularity, it will shift production back to the United States, creating jobs and wealth in the process.

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<sup>6</sup> Manufacturing 2.0: A More Prosperous California

<sup>7</sup> The Facts About Modern Manufacturing, 8th Edition

<sup>8</sup> Boiling Point? The Skills Gap in U.S. Manufacturing

<sup>9</sup> The Reshore Initiative

## Manufacturing Clusters in California

### Defining the Clusters

The COE and CACT identified 17 unique manufacturing clusters in California. To be included, each cluster met at least one of the following criteria: (1) cluster industries link together based on upstream and downstream flows of products;<sup>10</sup> (2) cluster industries operate with related technologies or common inputs; and/or (3) cluster industries have related workforce needs. Size was also a consideration. Smaller manufacturing industries in terms of total employment were placed in a miscellaneous category if they did not fit within one of the established clusters. For example, broom, brush, and mop manufacturing was categorized as a miscellaneous industry because it employs fewer than 1,000 workers and does not align well with any of California's top clusters.

Industry clusters contribute a variety of benefits to a local economy. According to Cognizant 20-20 Insights, industry clusters reduce operating costs by shortening supply chains, increase the flow of information regarding new business opportunities, heighten interdependence and mutual trust among the supply chain, and speed up identification of gaps in products or services.<sup>11</sup> Cluster firms may also have reduced risk of failure as these firms are better aligned and can respond rapidly to problems. In California, the 17 unique manufacturing clusters selected include:

- **Aerospace Manufacturing** – firms that manufacture or assemble complete aircraft, aircraft engine, engine parts, aircraft parts, guided missiles, space vehicles, auxiliary equipment, and search, detection & navigation instruments. Support firms that provide expertise in design and production in areas such as precision tuning, control systems, and fluid power valve design are also included in this cluster.
- **Biotechnology, Medical Devices, & Pharmaceutical Manufacturing** – firms that use cellular and molecular processes to produce value-add products, ranging from pharmaceuticals, medical devices to environmental pesticides.
- **Building Materials Manufacturing** – firms that specialize in manufacturing building materials for the residential, commercial, and industrial sectors. The cluster includes firms that produce raw materials (sawmills, asphalt, adhesives, etc.) to finished products (windows, flooring, pipes, etc.) as well as firms that produce supporting materials (edge tools, saw blades, etc.).
- **Chemical Manufacturing** – firms that manufacture industrial chemicals, fertilizers/pesticides, and miscellaneous chemical products.
- **Computers/Electronics Manufacturing** – firms that manufacture computer and peripheral equipment, communications equipment, audio and video equipment, semiconductors, electronic components, and measuring, electromedical, and control instruments. This cluster also includes firms that manufacture and produce magnetic and optical media.
- **Dental Equipment, Supplies & Laboratories Manufacturing** – firms that are engaged in manufacturing dental equipment and supplies used by dental laboratories and offices of dentists, such as dental chairs, dental instrument delivery systems, dental hand instruments, and dental impression material and dental cements. This cluster also includes labs that produce dentures, crowns, bridges, and orthodontic appliances customized for individual application.
- **Fashion/Clothing Manufacturing** – firms that manufacture apparel, footwear, jewelry, handbags, luggage, and other accessories. This cluster also includes support firms that produce yarns, threads, fabrics, and other support materials needed to manufacture the finished product.

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<sup>10</sup> Supplier firms were grouped with firms that manufacture the finished product. Non-manufacturing industries, such as wholesale trade and retail, were generally excluded from the clusters.

<sup>11</sup> Cluster Manufacturing: A Supply Chain Perspective

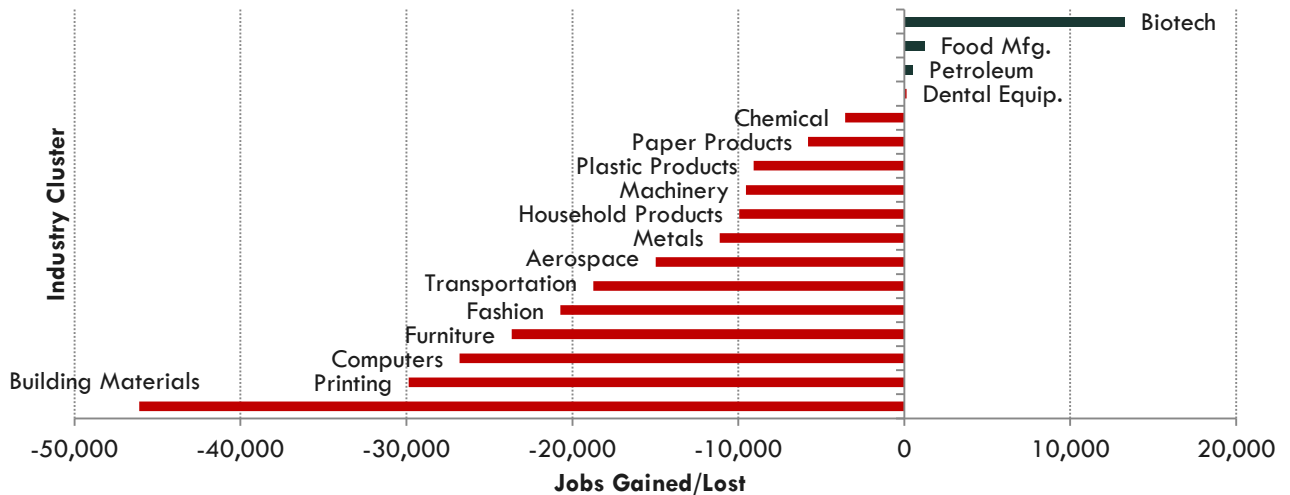
- **Food Manufacturing** – firms that process fruits and vegetables, meats, dairy products and other raw foods in a way that adds value to consumers.
- **Furniture Manufacturing** – firms that manufacture household, office, and institutional furniture, kitchen cabinets, shelving, partitions, and other supportive materials.
- **Household Products Manufacturing** – firms that specialize in various household items such as rugs, curtains, lighting, pots/pans, utensils, and appliances.
- **Machinery Manufacturing** – firms that manufacture agriculture, construction, and mining machinery; industrial machinery; commercial and service industry machinery; ventilation, heating, air-conditioning, and commercial refrigeration equipment; metalworking machinery; engine, turbine, and power transmission equipment; and other general purpose machinery.
- **Metals Manufacturing** – firms that manufacture primary metals, structural metals, metal containers, metal treated products, and fabricated metal products. This cluster also includes supportive industries, such as foundries and forging and stamping firms.
- **Paper Products Manufacturing** – firms that convert paper to value-add products, such as paperboard boxes, food containers, stationery, and sanitary paper products. This cluster also includes supportive industries, such as pulp, paper, and paperboard mills and printing ink firms.
- **Petroleum Manufacturing** – firms that engaged in (1) refining crude petroleum into refined petroleum, (2) manufacturing acyclic or aromatic hydrocarbons that are made from petroleum or liquid hydrocarbons and/or (3) manufacture petroleum products.
- **Plastic Products Manufacturing** – firms that engage in manufacturing plastic products, such as plastic bags, packaging film, polystyrene foam products, and plastic bottles. This cluster also includes chemical industries that support plastic production.
- **Printing and Publishing** – firms that engage in printing text and images on paper, metal, glass, apparels, and other materials, as well as those that produce and disseminate literature or information through books, newspapers, and periodicals.
- **Transportation Manufacturing** – firms that engage in manufacturing motor vehicles, trailers, and related parts; railroad rolling stock; ships and boats; and other transportation equipment. This cluster also includes supportive industries such as oils/lubricants and component parts.

## Labor Market Trends

### Employment Trends

With the exception of food manufacturing, biotechnology, dental equipment, and petroleum, nearly every manufacturing cluster in California has shed jobs over the last five years. Building materials lost the most jobs with a decline of 32%, followed by printing (22%), and computers/electronics (10%). However, the manufacturing sector regained momentum in 2011, adding jobs in almost all 17 clusters.

**Exhibit 1: Historical Change in Employment (2006-2011)<sup>12</sup>**



**Table 1: Historical Change in Employment (2006-2011)<sup>12</sup>**

Industry Cluster (data sorted by cluster size)	2006 Employment	2011 Employment	2006-11 Change	% Change
Computers/Electronics	267,261	240,466	-26,795	-10%
Food Mfg.	202,052	203,286	1,234	1%
Biotech	167,895	181,170	13,275	8%
Aerospace	191,119	176,134	-14,985	-8%
Printing	138,610	108,741	-29,869	-22%
Building Materials	143,798	97,692	-46,106	-32%
Fashion	111,989	91,267	-20,722	-19%
Machinery	86,151	76,601	-9,550	-11%
Metals	65,934	54,804	-11,130	-17%
Plastic Products	48,851	39,780	-9,071	-19%
Transportation	57,151	38,412	-18,739	-33%
Furniture	56,542	32,892	-23,650	-42%
Paper Products	29,706	23,915	-5,791	-19%
Household Products	33,623	23,679	-9,944	-30%
Dental Equip.	17,424	17,555	131	1%
Chemical	19,281	15,722	-3,559	-18%
Petroleum	12,676	13,192	516	4%

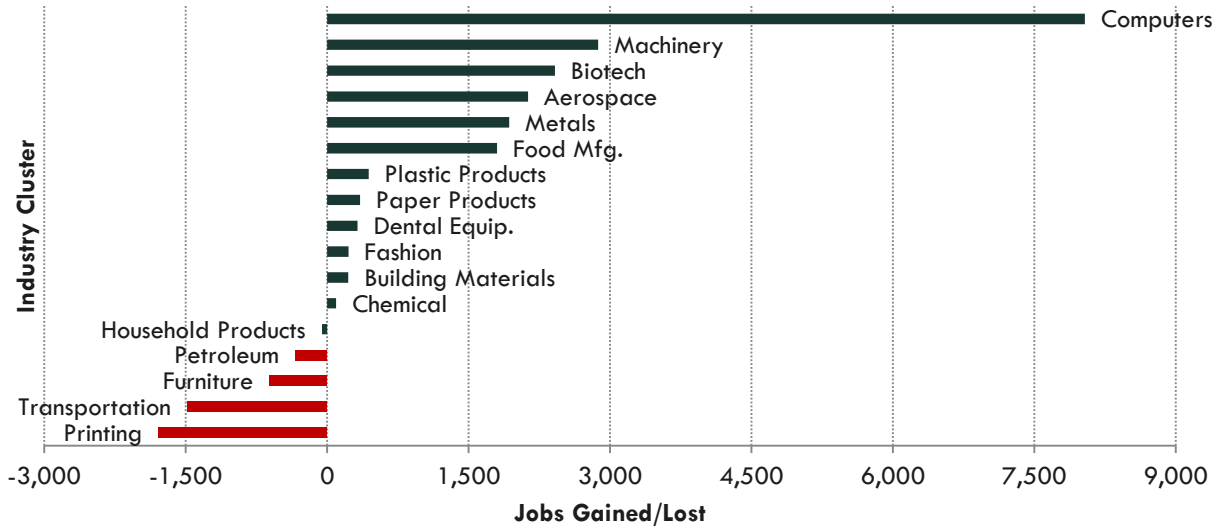
<sup>12</sup> EMSI Complete Employment – 2011.4



## Job Growth in 2011

Last year was a dynamic year for the manufacturing sector. As shown below, most manufacturing clusters in California gained anywhere from 200 to 8,000 jobs. The computers/electronics sector added the most jobs with growth of three percent for the year, followed by biotech (one percent) and aerospace (one percent). If the uptick in employment continues, this data may serve as early indicator of a more optimistic outlook for future growth than in previous years.

**Exhibit 2: Recent Change in Employment (2010-2011)<sup>13</sup>**



**Table 2: Recent Change in Employment (2010-2011)<sup>13</sup>**

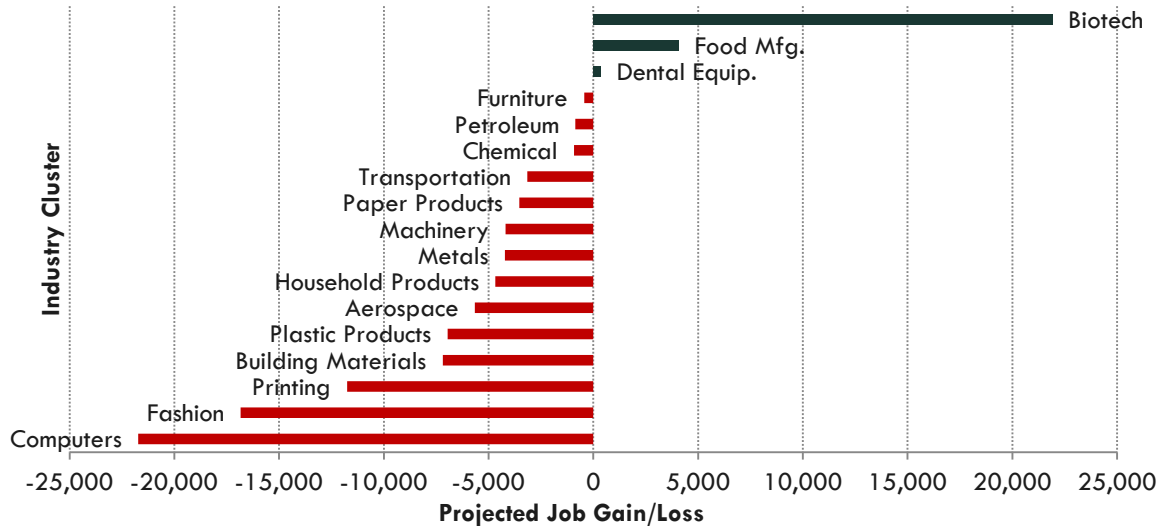
Industry Cluster (sorted by cluster size)	2010 Employment	2011 Employment	2010-11 Change	% Change
Computers/Electronics	232,430	240,466	8,036	3%
Food Mfg.	201,485	203,286	1,801	1%
Biotech	178,756	181,170	2,414	1%
Aerospace	174,004	176,134	2,130	1%
Printing	110,530	108,741	-1,789	-2%
Building Materials	97,468	97,692	224	0%
Fashion	91,042	91,267	225	0%
Machinery	73,726	76,601	2,875	4%
Metals	52,874	54,804	1,930	4%
Transportation	39,897	38,412	-1,485	-4%
Plastic Products	39,341	39,780	439	1%
Furniture	33,501	32,892	-609	-2%
Household Products	23,736	23,679	-57	0%
Paper Products	23,568	23,915	347	1%
Dental Equip.	17,232	17,555	323	2%
Chemical	15,629	15,722	93	1%
Petroleum	13,533	13,192	-341	-3%

<sup>13</sup> EMSI Complete Employment – 2011.4

## Five Year Outlook

Due to the poor performance of the manufacturing sector for more than a decade, 14 of the 17 clusters are projected to decline over the next five years. Computers/electronics, fashion, and printing are expected to lose the most jobs. The poor outlook may be due to how the projections are calculated. Employment projections utilize long-term historic trends in the sector to project future activity. As such, one year of positive growth has a small impact on the outlook.

**Exhibit 3: Projected Employment Growth (2011-2016)<sup>14</sup>**



**Table 3: Projected Employment Growth (2011-2016)<sup>14</sup>**

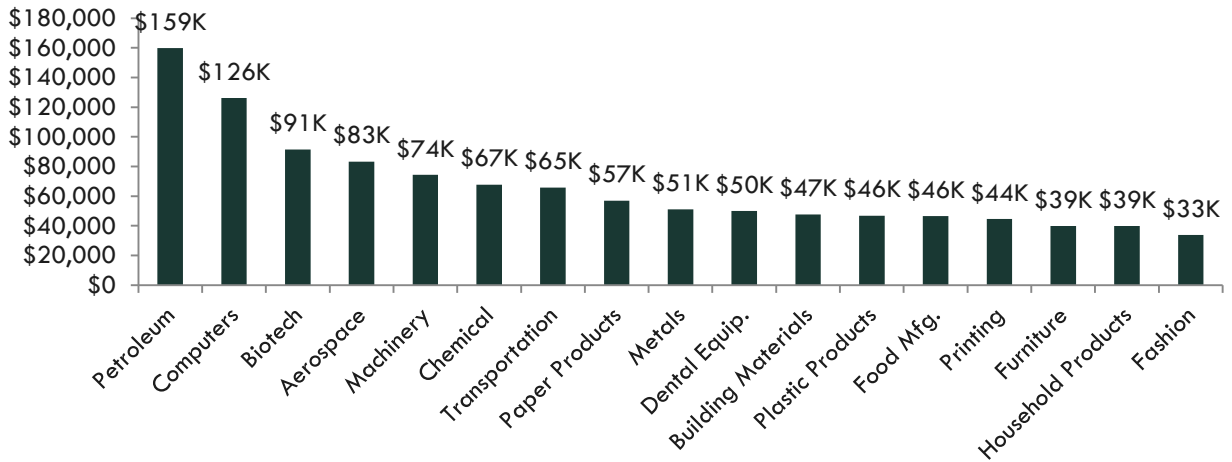
Industry Cluster (sorted by cluster size)	2011 Employment	2016 Employment	2011-16 Change	% Change
Computers/Electronics	240,466	218,738	(21,728)	-9%
Food Mfg.	203,286	207,364	4,078	2%
Biotech	181,170	203,079	21,909	12%
Aerospace	176,134	170,480	(5,654)	-3%
Printing	108,741	96,984	(11,757)	-11%
Building Materials	97,692	90,504	(7,188)	-7%
Fashion	91,267	74,431	(16,836)	-18%
Machinery	76,601	72,410	(4,191)	-5%
Metals	54,804	50,576	(4,228)	-8%
Plastic Products	39,780	32,826	(6,954)	-17%
Transportation	38,412	35,258	(3,154)	-8%
Furniture	32,892	32,464	(428)	-1%
Paper Products	23,915	20,389	(3,526)	-15%
Household Products	23,679	19,007	(4,672)	-20%
Dental Equip.	17,555	17,890	335	2%
Chemical	15,722	14,806	(916)	-6%
Petroleum	13,192	12,335	(857)	-6%

<sup>14</sup> EMSI Complete Employment – 2011.4

## High Wages

In general, manufacturing firms pay their workers well. On average, manufacturing workers earn an average of \$72,000 annually,<sup>15</sup> 30% more than the average worker in California. Workers in the petroleum cluster receive the highest pay, follow by the computers/electronics and biotech clusters. Further, manufacturing firms are more likely to provide benefits than other industries (such as health insurance, pension or retirement plans, and paid time off).<sup>16</sup> Although this practice results in higher staffing costs for the sector, it also helps to attract and retain talented workers.

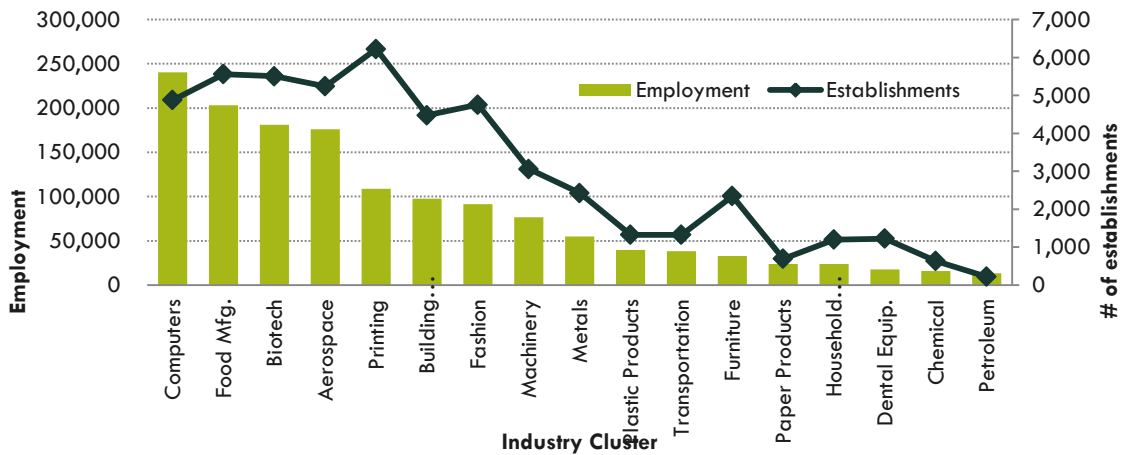
**Exhibit 4: Wages, Salaries, & Proprietor Earnings (2011)<sup>17</sup>**



## Establishments of all Sizes

The following chart displays the number of establishments and employment within each manufacturing cluster in California. As shown, the printing sector has the most establishments with the fifth-highest level of employment. This indicates that the printing cluster is dominated by small firms. Furniture manufacturing is also comprised of smaller firms when compared to other clusters of similar size.

**Exhibit 5: Establishments and Employment by Cluster (2011)<sup>17</sup>**



<sup>15</sup> Wage data referenced throughout this report represents payroll averages for the cluster. Payroll wages are calculated from quarterly aggregate payroll totals divided by the number of employees in a sector, regardless of occupational classification (job title).

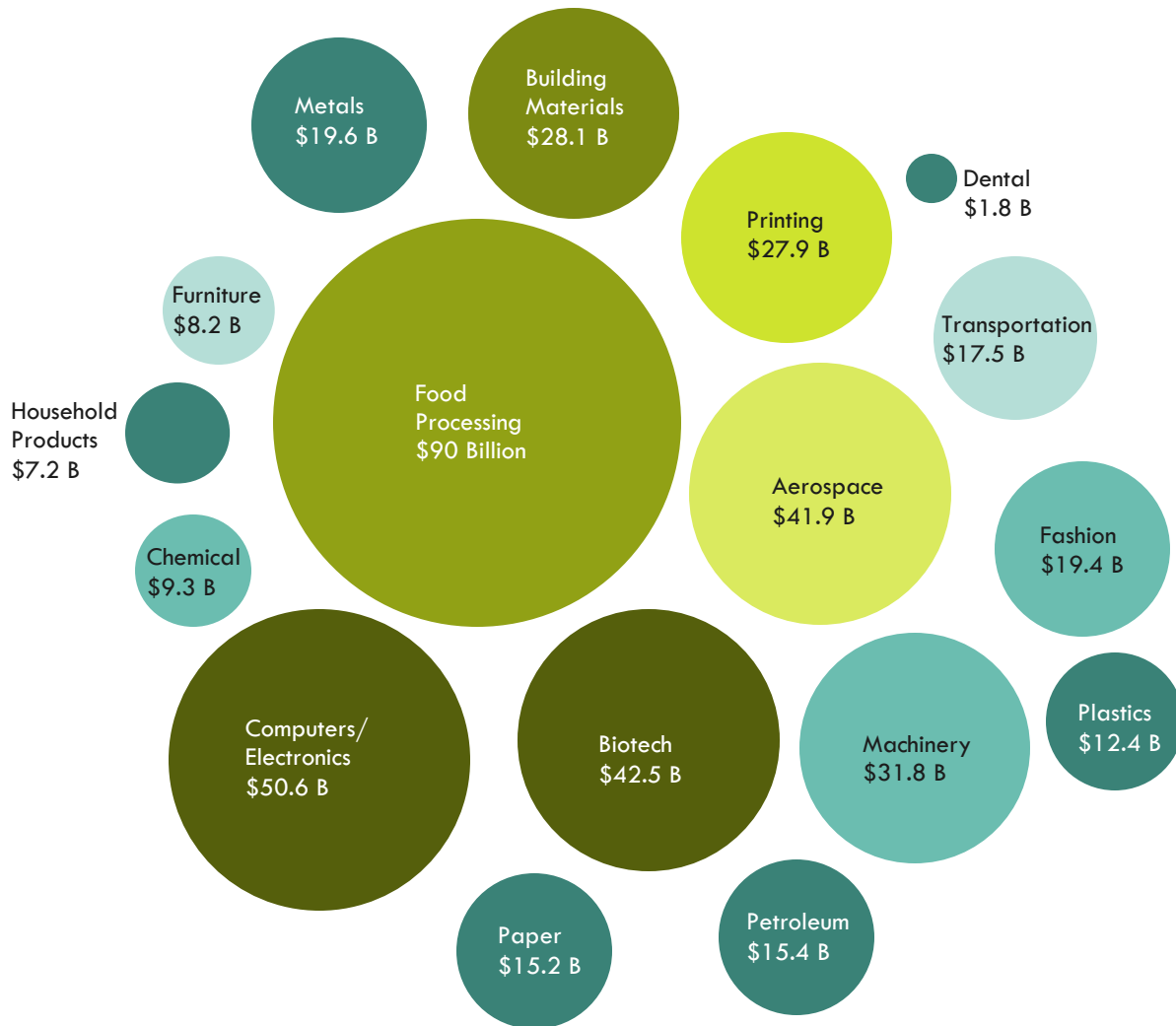
<sup>16</sup> The Facts About Modern Manufacturing, 8<sup>th</sup> Edition

<sup>17</sup> EMSI Complete Employment – 2011.4

## Revenue

The manufacturing sector generated nearly \$439 billion in revenue in 2010. Food manufacturing generated the most revenue (\$90 billion), followed by computers/electronics (\$50.6 billion), biotech (\$42.5 billion), and aerospace (\$41.9 billion).<sup>18</sup> As stated previously, sales in the manufacturing sector have a significant impact on the economy. Not only does revenue generated in the clusters 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.

**Exhibit 6: Revenue by Cluster (2010)<sup>18</sup>**



<sup>18</sup> InfoUSA, 2011

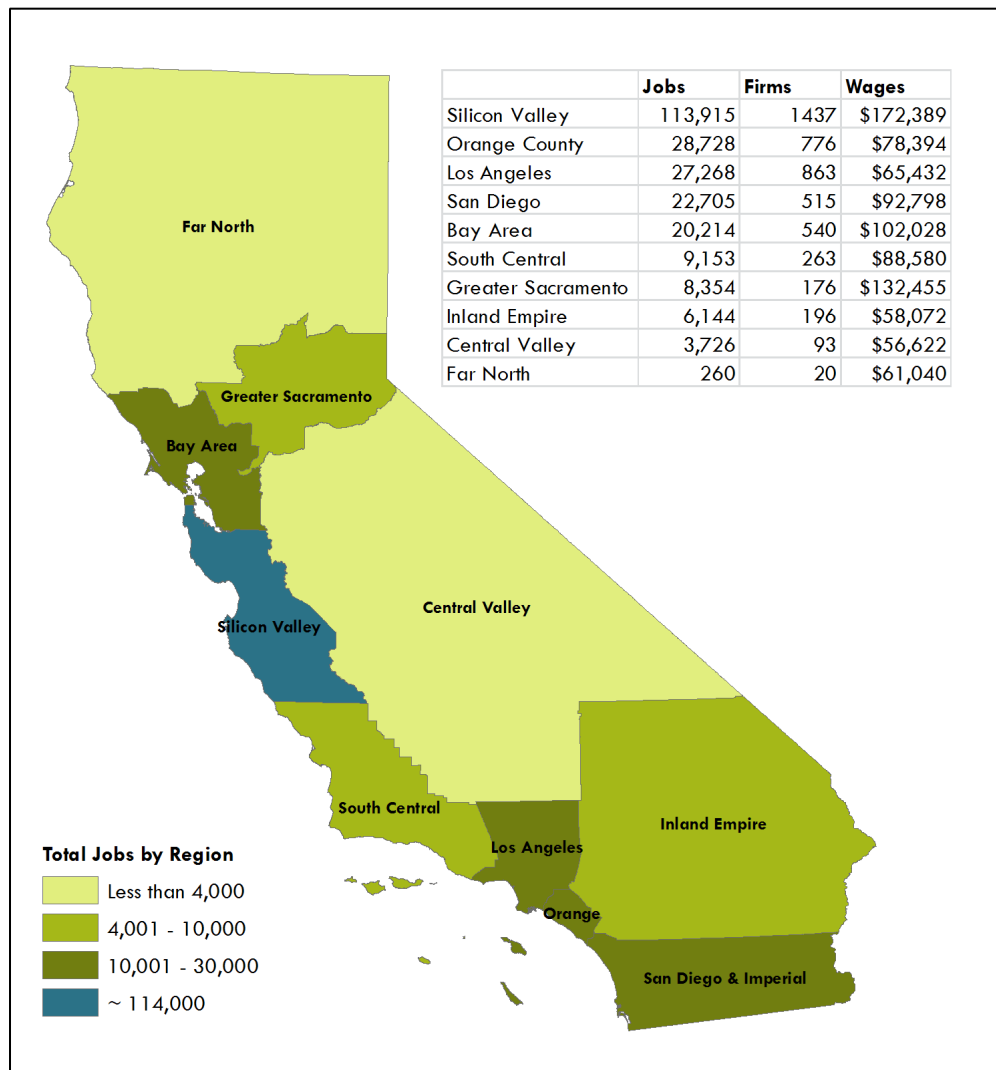
## Regional Comparisons

This section of the report compares the top five manufacturing clusters by region in California. Based on employment, the top five clusters include: (1) Computer/Electronics, (2) Food Manufacturing; (3) Biotechnology, Medical Devices, & Pharmaceutical Manufacturing; (4) Aerospace; and (5) Printing and Publishing.

### Computers/Electronics

It is with no surprise that the Silicon Valley has the largest employment, most number of establishments, and highest wages in the computers/electronics cluster. Since the early 1980s and the rise of the personal computer, the Silicon Valley has attracted high tech entrepreneurs and investments to the region. This trend continued through the last decade even with the escalation of outsourcing. Orange County, Los Angeles, San Diego and the Bay Area also have substantial employment in this cluster.

**Map 1: Computers/Electronics Employment by Region<sup>19</sup>**

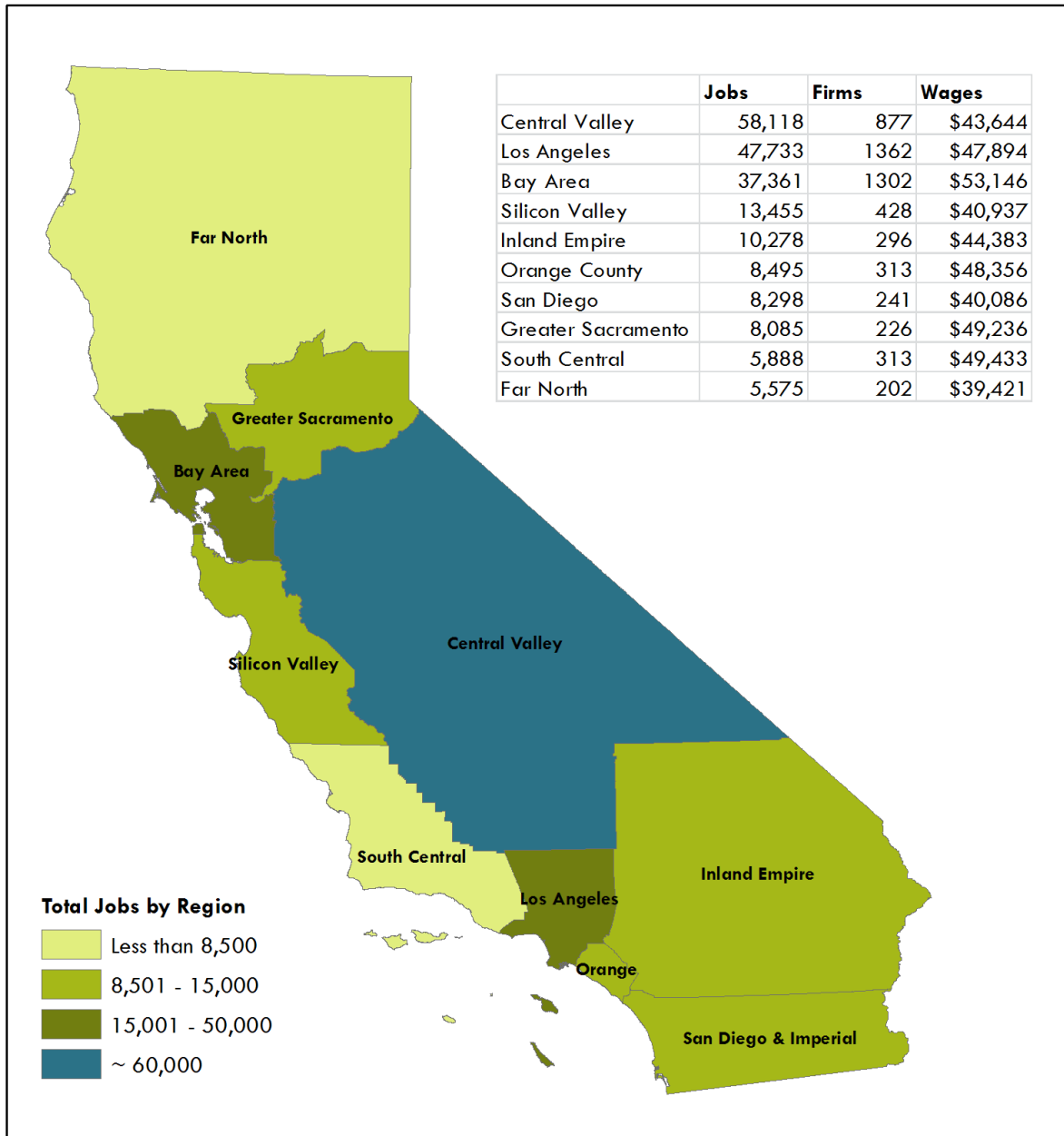


<sup>19</sup> EMSI Complete Employment – 2011.4. Jobs, Firms, and Wages represent 2011 data.

## Food Manufacturing

The Central Valley employs more food manufacturing workers than any other region in California with about 58,000 workers in 2011. Food manufacturing firms tend to be larger in size in the Central Valley region than in other areas of California (66 workers per firm in the Central Valley versus 37 workers per firm on average for California). Overall, the food manufacturing cluster thrives in the Central Valley because of proximity to natural resources as well as reduced operating expenses (lower wages, rents, etc.). Not far behind the Central Valley, Los Angeles and the Bay Area have substantial employment in the cluster. Access to ports may be one of the key factors attracting food manufacturing firms to these two regions.

**Map 2: Food Manufacturing Employment by Region<sup>20</sup>**

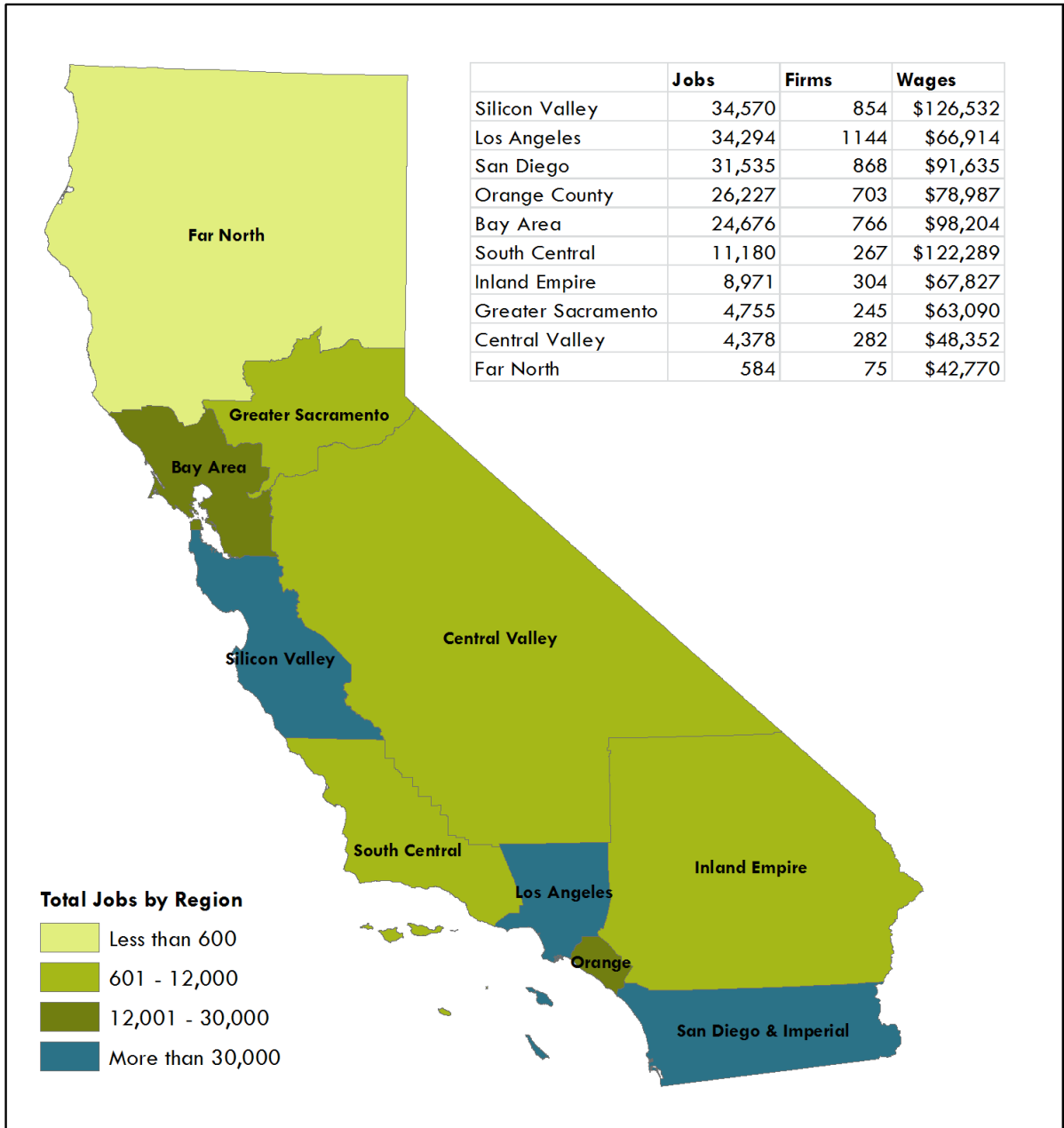


<sup>20</sup> EMSI Complete Employment – 2011.4. Jobs, Firms, and Wages represent 2011 data.

### Biotechnology, Medical Devices & Pharmaceutical Manufacturing

The coastal regions dominate the biotech cluster. Silicon Valley and Los Angeles have the highest employment levels in this cluster, followed by San Diego, Orange County, and the Bay Area. This cluster provides higher than average wages to their employees with an average of \$91,400 per biotech worker compared to an average of \$42,700 among all manufacturing workers in California.

**Map 3: Biotech Employment by Region<sup>21</sup>**

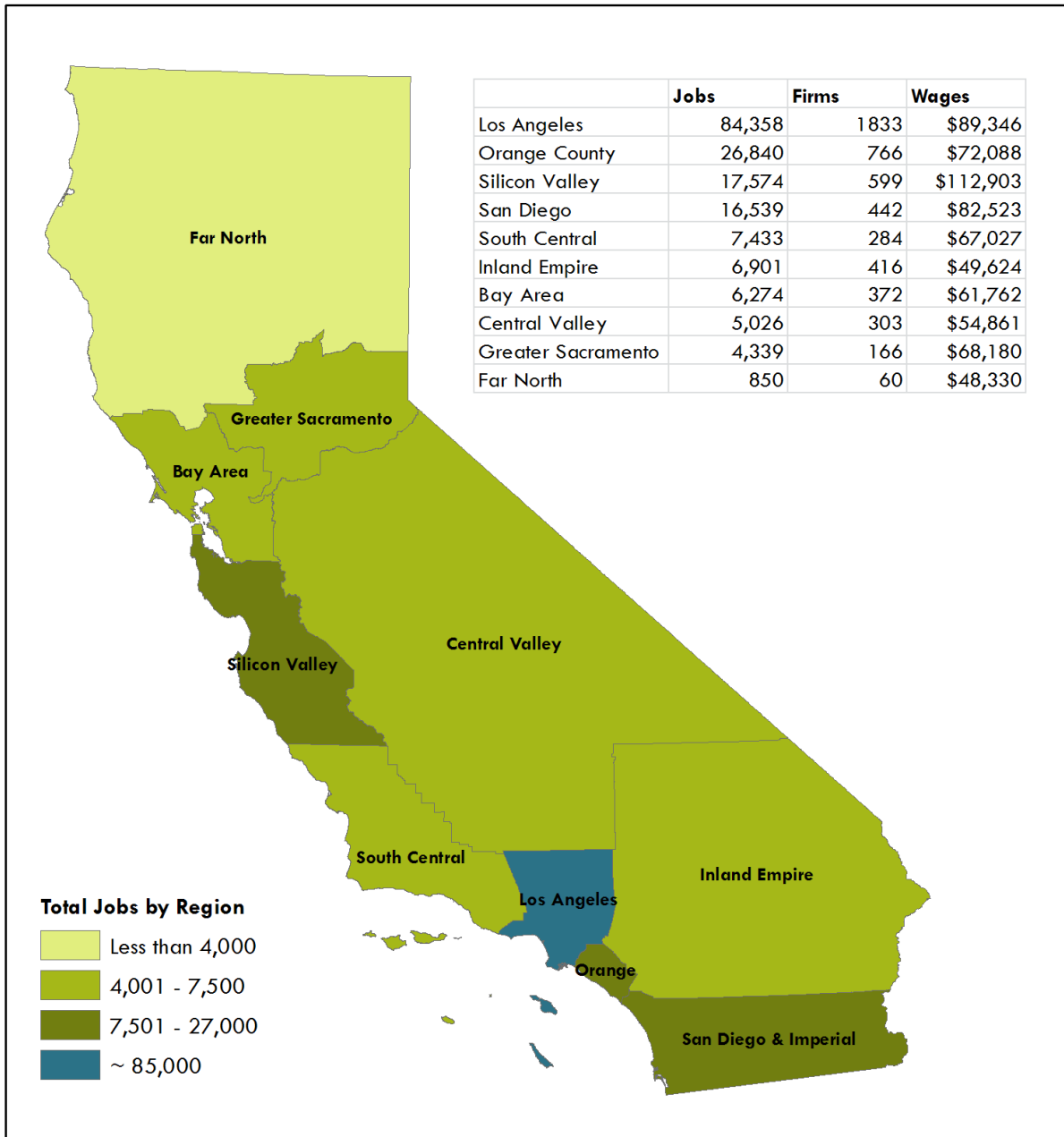


<sup>21</sup> EMSI Complete Employment – 2011.4. Jobs, Firms, and Wages represent 2011 data.

## Aerospace

Three out of four jobs in the Aerospace cluster are located in Southern California (Los Angeles, Orange, and San Diego Regions). These firms provide excellent wages to their employees, ranging from \$72,100 in Orange County to \$89,300 in the Los Angeles Region. There are a number of factors that attract Aerospace firms to this area, including a strong supplier presence, an educated workforce, and a variety of research institutions that support the cluster's technological advancements. Silicon Valley also has substantial employment with high wages in this cluster.

**Map 4: Aerospace Employment by Region<sup>22</sup>**



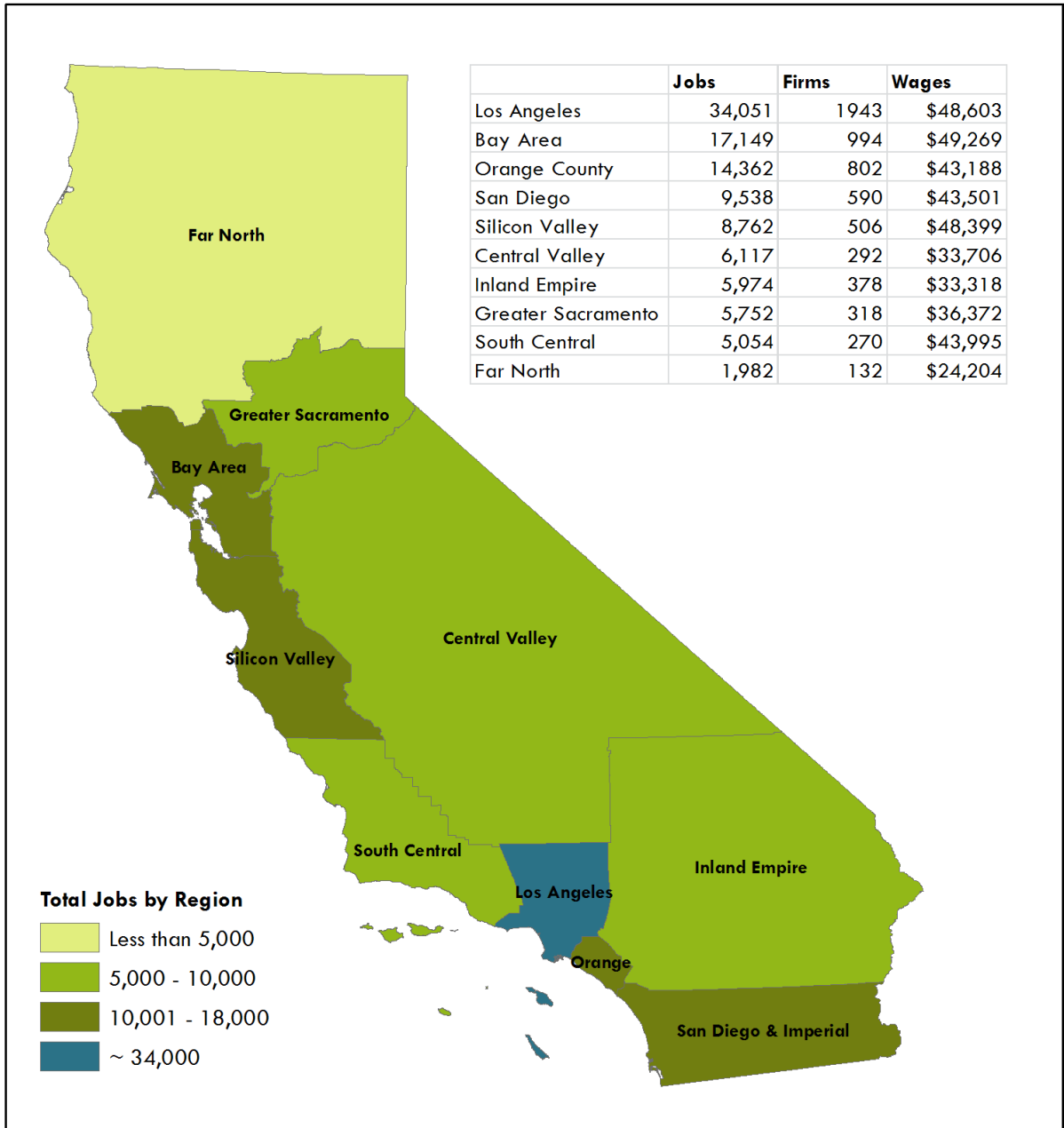
<sup>22</sup> EMSI Complete Employment – 2011.4. Jobs, Firms, and Wages represent 2011 data.



## Printing and Publishing

The Los Angeles Region has the most printing and publishing jobs in California, followed by the Bay Area, Orange County, San Diego and the Silicon Valley. The state's average printing and publishing wage is \$44,500, slightly above statewide average for all workers. Firms in this sector tend to be small with about 17 workers per firm.

**Map 5: Printing and Publishing Employment by Region<sup>23</sup>**



<sup>23</sup> EMSI Complete Employment – 2011.4. Jobs, Firms, and Wages represent 2011 data.

## Summary

California's manufacturing sector has experienced a steady decline for over a decade. However, in the last year, it has made steps toward recovery with an increase in both jobs and international exports. California's community colleges can play a substantial role in supporting the growth of the manufacturing sector by providing training and services that ensure an available pipeline of skilled workers. As each region has a unique mix of manufacturing firms with specialized employment needs, it is important for local colleges and the CACT to develop programs that match the local demand. The top five manufacturing clusters in California include:

- **Computers/Electronics:** the Silicon Valley has the highest concentration of computer/electronic jobs in the state. Firms in this cluster need workers that have advanced knowledge of electrical systems and circuits.
- **Food Manufacturing:** the Central Valley employs more food manufacturing workers than any other region in state. Firms in this cluster need workers that are familiar with the agricultural supply-chain and harvesting/production techniques.
- **Biotechnology, Medical Devices & Pharmaceutical Manufacturing:** the Silicon Valley and Los Angeles have the highest employment levels in this cluster. Firms in this cluster need workers that have expertise in applying cellular and molecular processes to produce value-add products.
- **Aerospace:** Three out of four jobs in the Aerospace cluster are located in Southern California (Los Angeles, Orange, and San Diego Regions). Firms in this cluster need workers that have expertise in the design and production of aircrafts and related systems (e.g. precision tuning, control systems, and fluid power valve design).
- **Printing/Publishing:** Los Angeles has the highest concentration of printing/publishing jobs in the state. Firms in this cluster need workers that have expertise in producing and disseminating literature or information through books, newspapers, and periodicals.

To support continued growth in manufacturing in California, the CACT encourage state legislators and local jurisdictions to adopt policies that remove operating barriers – such as removing red tape associated with environmental impact studies and business permits; providing incentives to offset high operating costs; and securing grants that support advanced manufacturing research and development.

To further understand the workforce and training needs of the manufacturing sector, the Center of Excellence recommends additional research on the top five clusters in California. This research should include an assessment of the historic and projected growth, revenue trends, and occupational demand.

## References

"2005 Skills Gap Report - A Survey of the American Manufacturing Workforce." 2005.

Cognizant. *Cluster Manufacturing: A Supply Chain Perspective*. Teaneck, 2011.

DeVol, Ross, et al. *Manufacturing 2.0: A More Prosperous California*. Santa Monica: Milken Institute, 2009.

*EMSI Complete Employment - 2011.4*. 24 January 2012. <economicmodeling.com>.

*International Trade Administration, U.S. Department of Commerce*. 24 January 2012.  
<<http://tse.export.gov/TSE/TSEhome.aspx>>.

Morrison, Tom, et al. "Boiling Point? The Skills Gap in U.S. Manufacturing." 2011.

"The Facts About Modern Manufacturing, 8th Edition." 2009.

*The Reshore Initiative*. 13 February 2012. <[http://www.reshorenow.org/why\\_reshore/](http://www.reshorenow.org/why_reshore/)>.

## Appendix A: About the Centers for Applied Competitive Technologies

The Centers for Applied Competitive Technologies (CACT) specialize in providing workforce training and technical consultation to help businesses solve operational, personnel, and technical problems in the manufacturing environment. The CACTs offer technology education, manufacturing training, and consulting services that contribute to continuous workforce development, technology deployment and business development. Services include:

- Customized workforce training in areas such as just-in-time production, distribution cycles, and six sigma deployment.
- Consulting services in areas such as organization assessment, quality system audits, process capability, and strategic planning.
- Technical services that provide an unbiased professional evaluation of your advanced technology processes.

The CACTS are funded primarily by the California Community College Economic and Workforce Development Program. These grant funds enable Centers to offer cost-effective workforce training and consultative services for California's advanced technology businesses. The program goal is to provide companies the technical expertise they need to compete successfully in changing markets and the global economy. The CACTs are conveniently located at community colleges across the state. In addition affiliate sites at other colleges are being established. To learn more about these Centers contact one of those listed below or visit [www.makingitincalifornia.com](http://www.makingitincalifornia.com).

### **CACT @ College of the Canyons**

26455 Rockwell Canyon Rd.  
Santa Clarita, CA 91355  
(661) 362-3111

### **CACT @ San Diego City College**

1414 Park Blvd., Room T-216  
San Diego, CA 92101-8747  
(619) 388-3730

### **CACT @ De Anza College**

Foothill-De Anza Community College District  
Professional & Workforce Development  
12345 El Monte Road  
Los Altos Hills, CA 94022  
(650) 949-7795

### **CACT @ College of the Sequoias**

915 S. Mooney Blvd.  
Visalia, CA 93277  
(559) 737-4838

### **CACT @ El Camino College**

13430 Hawthorne Blvd.  
Hawthorne, CA 90250  
(310) 973-3170

### **CACT @ Sierra College**

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## **Appendix B: About the Centers of Excellence**

The Centers of Excellence (COE), in partnership with business and industry, deliver regional workforce research customized for community college and workforce system decision making and resource development. The Northern California COE is one of five regional Centers of Excellence supported by the Chancellor's Office of the California Community Colleges and is tasked with conducting environmental scanning, partnership development and technical assistance activities.

The COE's research team represents expertise in labor market analysis, labor-management partnership projects, project management, and primary research. COE staff are experienced researchers with a focus on research design, partnership development, educational and training program mapping, and identifying skill sets for emerging occupations as well as key skill sets and geospatial analysis.

The COE maintains strategic alliances with research organizations whose relationships and technical expertise enhance COE's research efforts. These alliances enable COE to access information from over 80 public databases using EMSI economic modeling software, GIS technology via the use of a customized geo-mapping software that ties industry codes (NAICS) to a private business database of over 1 million business records. The COE maintains robust partnerships with industry associations that assist in validating research findings, ensuring that the most recent industry and labor market conditions are captured.

COE studies are used to inform policy discussions, industry-wide legislative efforts, and regional workforce development strategies, as well as guide program and resource development efforts by the California Community Colleges. These reports can be accessed at [www.coecc.net](http://www.coecc.net).

## Appendix C: Regions in California

This study provides data for the following regions.<sup>24</sup>

<b>Region</b>	<b>Counties</b>
Bay Area	Alameda, Contra Costa, Marin, Napa, San Francisco, Solano, Sonoma
Central Valley	Alpine, Amador, Calaveras, Fresno, Inyo, Kern, Kings, Madera, Mariposa, Merced, Mono, San Joaquin, Stanislaus, Tulare, Tuolumne
Far North	Butte, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Plumas, Shasta, Sierra, Siskiyou, Tehama, Trinity
Greater Sacramento	El Dorado, Nevada, Placer, Sacramento, Sutter, Yolo, Yuba
Inland Empire	Riverside, San Bernardino
Los Angeles	Los Angeles
Orange	Orange
San Diego & Imperial	Imperial, San Diego
Silicon Valley	Monterey, San Benito, San Mateo, Santa Clara, Santa Cruz
South Central	San Luis Obispo, Santa Barbara, Ventura

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<sup>24</sup> Regions reflect definitions used by the California Community College Economic and Workforce Development program.