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SEVEN GROWTH SECTORS DRIVING CALIFORNIA'S CLEAN AND EFFICIENT ECONOMY

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SEVEN GROWTH SECTORS DRIVING CALIFORNIA'S CLEAN AND EFFICIENT ECONOMY
INTRODUCTION AND OVERVIEW

California's clean and efficient economy encompasses more of the state's total economy every day. There are important "growth" sectors that are helping facilitate this transition—a diverse base of companies that provide the products and services that enable business, government, education, residential, and other "users" to cut costs through energy savings, receive more economic value per unit of energy consumed, and reduce greenhouse gas emissions at the same time.

With the help of these growth sectors, California's long-standing economic drivers—from agriculture to manufacturing to health services—are transforming their own products and processes to cut costs, spur innovation, and maintain their competitiveness in a global economy. These growth sectors have a productive business relationship with the state's economic drivers, moving everyone towards a cleaner and more efficient economy, with benefits accruing to enablers and users alike.

This report takes a closer look at seven growth sectors of California's clean and efficient economy. These seven growth sectors are a subset of fifteen sectors of the Green Economy identified in Next 10's Many Shades of Green (see www.Next10.org), the sectors that specifically focus on greenhouse gas reductions. The table on the following page includes examples of the kinds of products and services provided by companies in these seven sectors.

Collectively, these seven sectors provide a critical infrastructure that supports business, government, and others in transforming their use of energy and reducing their emissions. They include companies involved in energy generation, storage, and infrastructure; those involved in alternative fuels and vehicles, as well as products, services, and advanced materials that help improve energy efficiency. Additionally, they include specialized finance and investment service firms that underwrite innovation and operations of companies in these growth sectors.

Just as information technology sectors are transforming the products and processes of the rest of the economy, so too are these energy-related growth sectors. These growth sectors are helping other industries become increasingly a part of California's clean and efficient economy.

It is important to track these growth sectors, not just for the jobs and economic vitality they directly generate, but because they have a positive ripple effect throughout the California economy. While the full range of those benefits is difficult to measure, one important indicator is the performance of companies in these growth sectors. If these companies are experiencing success serving the California market, then California users are increasingly making choices that are helping them save money, add value, and reduce emissions.

What this report finds is that these seven sectors have grown rapidly since the 1990s. They have consistently outpaced the growth of the overall California economy. From January 1995 to January 2010 these seven growth sectors more than doubled in size, experiencing a 109 percent rise in jobs, while the state's total employment grew by only 12 percent. The two largest sectors, Energy Generation and Energy Efficiency, generated over 32,900 new jobs and over 2,300 new establishments statewide between 1995 and 2010.

More recently, during the depths of the national and global recession (January 2009 to January 2010), these seven growth sectors in California were remarkably resilient, holding steady in terms of jobs. In contrast, California's overall economy lost significant ground, losing seven percent of its employment. During this time, three regions actually added jobs in these growth sectors, including the Los Angeles Area (up 1%), Orange County (up 2%), and the San Diego Region (up 1%) – in each case while the overall regional economy was losing jobs.

Even in difficult economic times, the products and services of companies in these growth sectors had sufficient market demand to maintain their employment levels. In fact, in the future, market demand in these areas is likely to increase rapidly as a result of the implementation of AB 32 and other California state policies.

SEVEN GROWTH SECTORS DRIVING CALIFORNIA'S CLEAN AND EFFICIENT ECONOMY

ENERGY GENERATION	Renewable energy generation (all forms of solar, wind, geothermal, biomass, hydro, marine & tidal, hydrogen, co-generation) Research & Testing in renewable energy	Associated equipment, controls, and other management software and services Renewable energy consulting services
ENERGY EFFICIENCY	Energy conservation consulting and software Building efficiency products (cables, glass, machinery etc.) Energy efficiency research	Alternative energy appliances (solar heating, lighting etc.) Energy efficiency meters & measuring devices
CLEAN TRANSPORTATION	Alternative fuels (biodiesel, hydrogen, ethanol, fueling infrastructure) Logistics (traffic monitoring software, transportation efficiencies)	Motor vehicles & equipment (electric, hybrid and natural gas, components and engines)
ENERGY STORAGE	Advanced batteries (Li-Ion, Ultra Capacitors, Charging, Thin Film, Nickel Zinc) Battery components & accessories	Fuel cells (methanol, PEM, solid oxide, zinc air, systems integrators) Hybrid Systems (flywheels) and Uninterruptible Power supply
FINANCE & INVESTMENT	Investment Advisory, asset management and brokerage Project financing & insurance	New materials for improving energy efficiency Emission trading and offsets
ADVANCED MATERIALS	Nano (additives, detectors, sensors, gels, coatings, lubricants, films)	Chemical (composites, polymers) Bio (advanced processes, biodegradable products etc.)
ENERGY INFRASTRUCTURE	Transmission (smart grid, sensors & concerns)	Power management, monitoring, metering, quality and testing Cable & equipment

SEVEN GROWTH SECTORS DRIVING CALIFORNIA'S CLEAN AND EFFICIENT ECONOMY

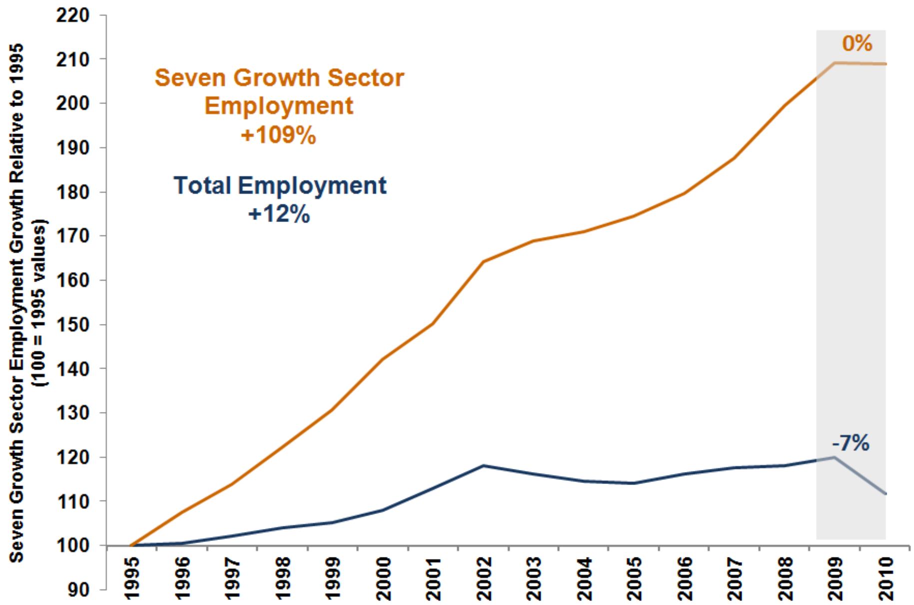
CALIFORNIA OVERVIEW

These seven sectors provide the products and services that enable the transformation toward a cleaner, more efficient and competitive economy.

The growth of these seven sectors has consistently outpaced that of the state. From January 1995 to 2010 the statewide employment in the seven sectors more than doubled (an increase of 109%), while jobs in the overall California economy expanded by 12 percent.

During the recent economic recession, these seven sectors showed greater resilience in terms of employment stability than the economy as a whole. In the last observable year, statewide employment fell seven percent, while jobs in the seven sectors remained stable, maintaining their employment level from the year before.

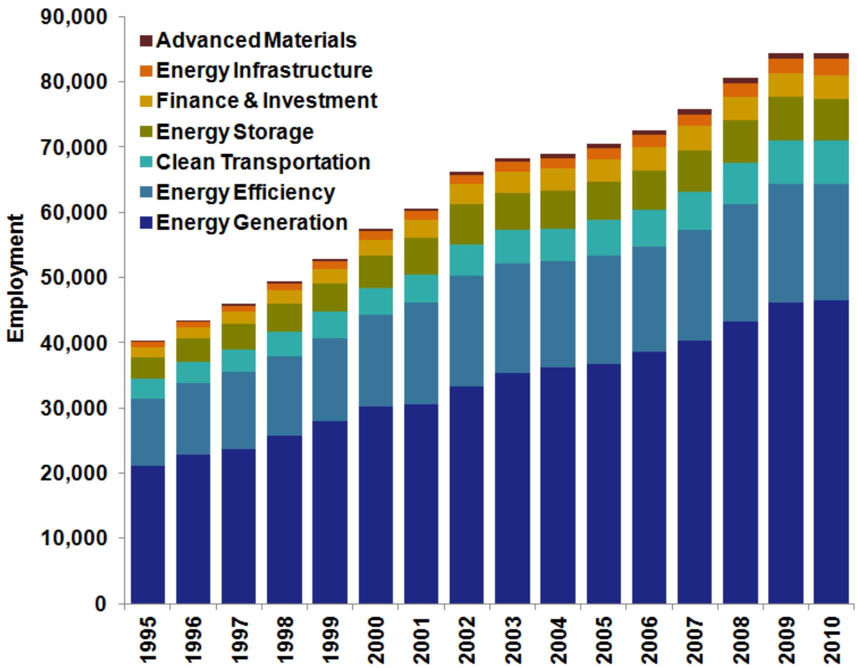
Employment Growth Relative to 1995: California



Data Source: Green Establishment Database. Analysis: Collaborative Economics

Employment distribution and gains vary across the seven sectors (See Appendix for Table: Seven Growth Sectors Employment). Over the last 15 years, two sectors (Energy Generation and Energy Efficiency) have accounted for more than three-quarters (76%) of the jobs. Combined, these two sectors have contributed over 32,900 new job opportunities statewide since 1995. In addition to Energy Generation, Clean Transportation, Finance & Investment, Energy Infrastructure, and Advanced Materials exceeded the average job growth across the seven sectors from 1995 to 2010.

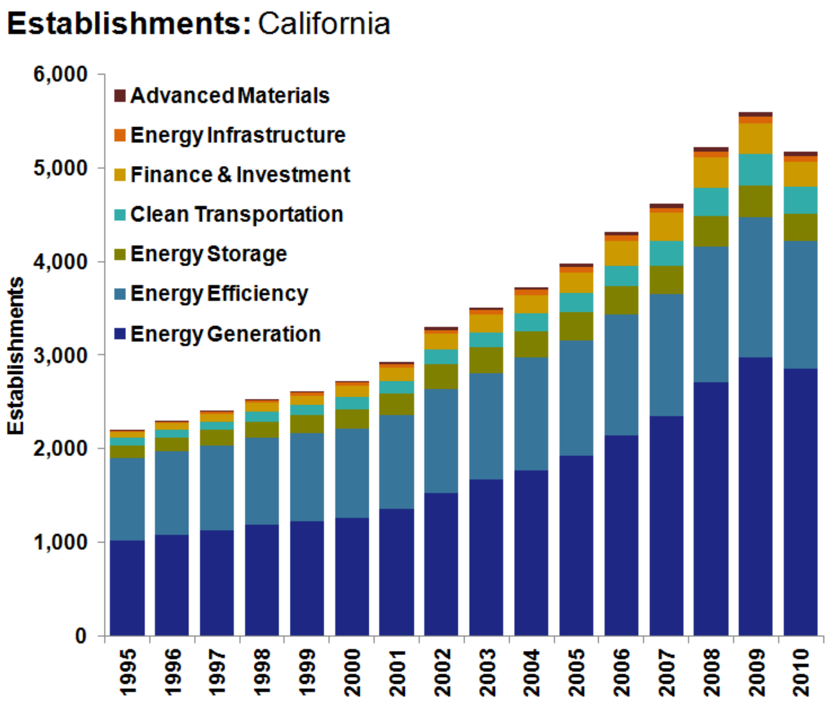
Employment: California



Data Source: Green Establishment Database. Analysis: Collaborative Economics

Many of these sizeable and rapidly growing sectors have continued to thrive during recent years, despite the economic downturn. While most sectors suffered employment losses from January 2009 to 2010, the reverse was the case for Energy Infrastructure, Advanced Materials, Clean Transportation and Energy Generation. Jobs were created in each of these sectors amidst tough economic conditions. Energy Infrastructure employment expanded by nearly 14 percent in 2010, with an addition of nearly 300 job opportunities statewide. Jobs in Advanced Materials increased by four percent, and Clean Transportation and Energy Generation each grew by one percent in 2010. Employment in each of these growth sectors has at least doubled since 1995.

CALIFORNIA OVERVIEW



Data Source: Green Establishment Database. Analysis: Collaborative Economics

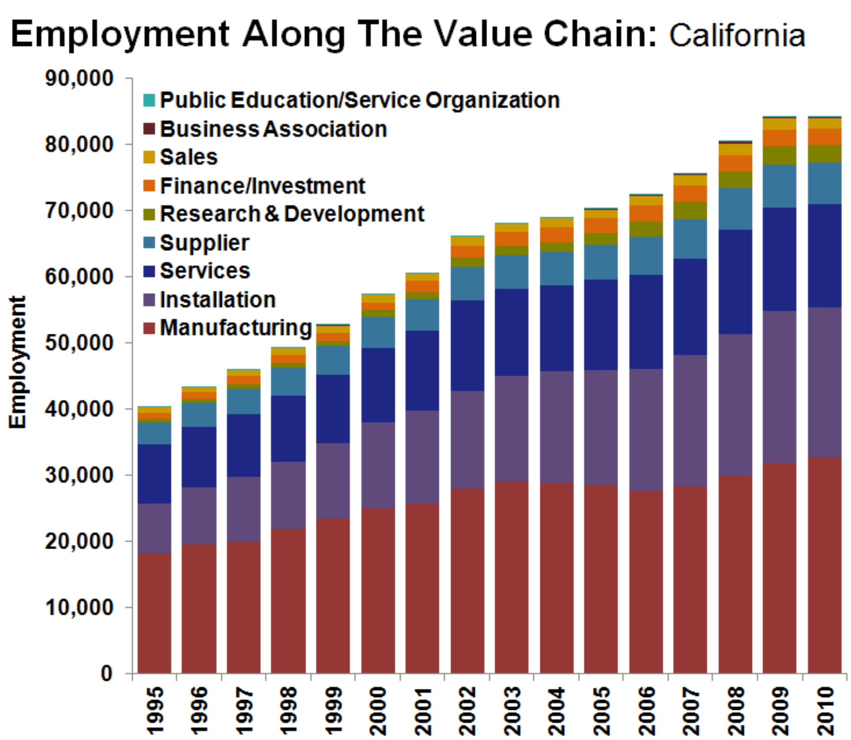
Since 1995, establishment growth has increased across nearly all of the seven sectors. In 2010, Energy Generation and Energy Efficiency accounted for the vast majority of the establishments across the seven sectors (82 percent). These two sectors have made the largest establishment gains since 1995, generating over 2,300 new establishments statewide, with the largest sector, Energy Generation, growing by 179 percent. Additionally, establishments in all but one sector, Energy Efficiency, have more than doubled since 1995.

The economic downturn and consolidation of firms broke the establishment growth trend during the January 2009 to 2010 period. Together, the seven sectors experienced an eight percent reduction in establishments. Despite this loss, these seven sectors weathered the depths of the economic downturn better than the California economy as a whole, which lost 14 percent of its establishments during this period. Moreover, because their overall employment levels were steady during this same time period, the seven sectors experienced a period of business consolidation rather than economic contraction.

Another way to examine the employment of the seven sectors is according to the primary function of specific establishments in those sectors. These primary functions include research and development, manufacturing, suppliers, installation, sales, and service providers—all part of the value chain of products and services that help enable California's clean and efficient economy.

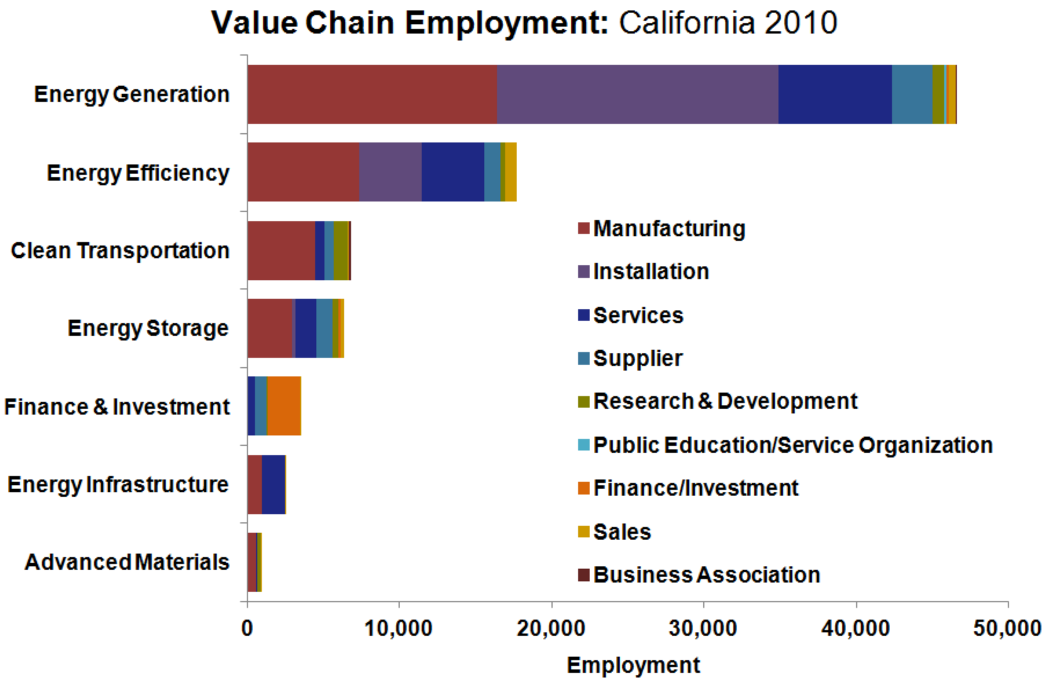
The largest number of jobs across the seven sectors is in establishments whose primary function is manufacturing. Jobs in manufacturing establishments in these sectors have been growing steadily since 2006—including a three percent gain during the depths of the economic downturn in 2009-2010.

Manufacturing and installation account for about two-thirds of the employment across the seven sectors. In 2010, 39 percent of the jobs in these sectors were in establishments whose primary function was manufacturing, while 27 percent were in establishments whose primary function was installation.



Data Source: Green Establishment Database. Analysis: Collaborative Economics

Despite the economic downturn, employment in installation establishments remained stable from January 2009 to 2010. And, over the longer term, installation has grown much faster than the seven sectors overall: while employment in the seven sectors more than doubled from 1995 to 2010, job growth in establishments whose primary function is installation tripled during this period, adding over 15,000 new jobs statewide.



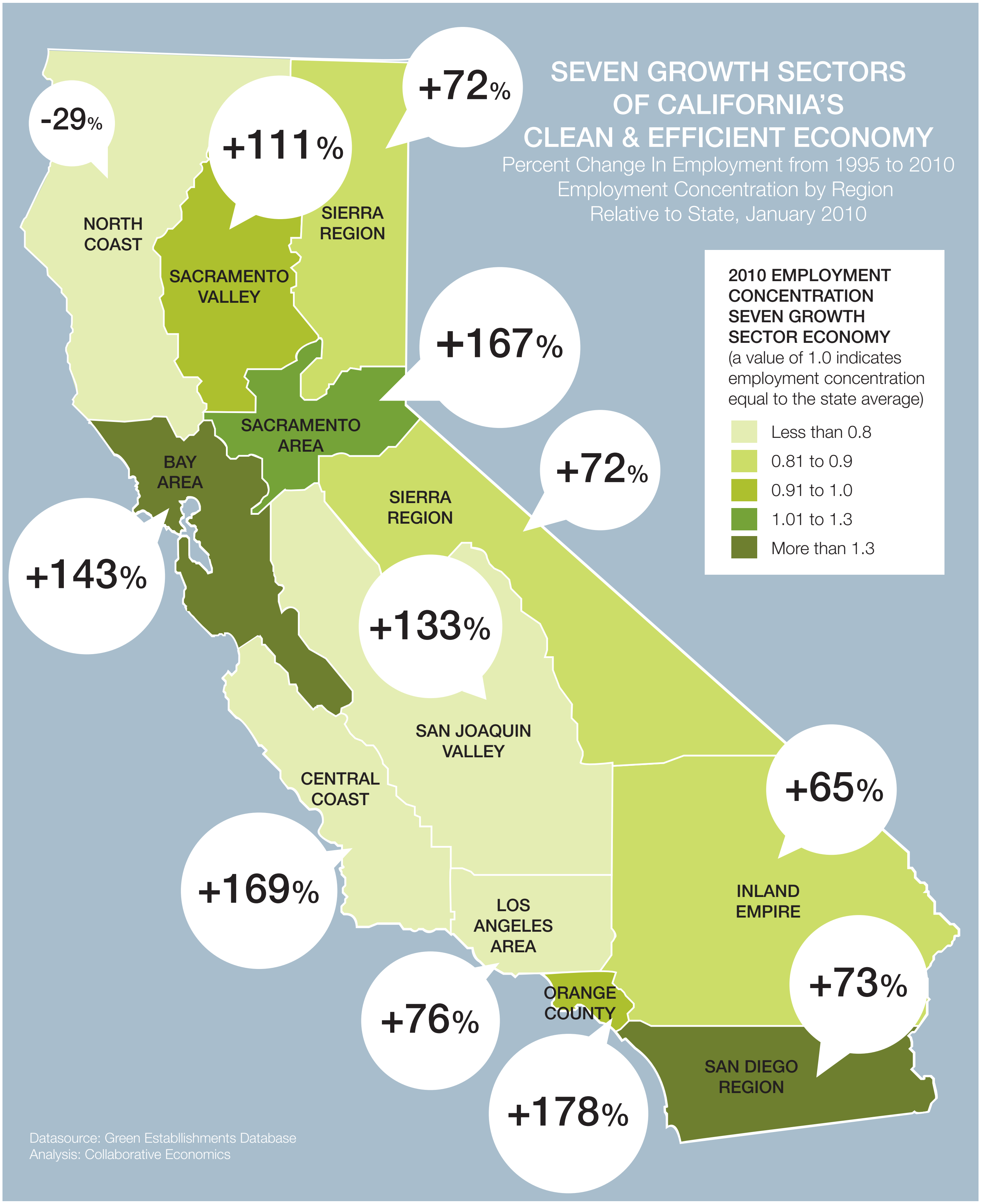
Data Source: Green Establishment Database. Analysis: Collaborative Economics

From January 2009 to 2010, employment in services and finance & investment establishments remained relatively stable, both declining by one percent. The largest losses took place in the smaller segments of sales and research & development, which contracted by 11 percent and 9 percent, respectively. However, these segments have displayed large gains in the long run; sales jobs have doubled since 1995 with the addition of more than 810 jobs, while research & development employment has quadrupled in the past 15 years adding nearly 2,000 jobs.

Energy Generation (the largest growth sector) is comprised mainly of manufacturing and installation jobs, accounting for 75 percent of this sector's employment. Additionally, manufacturing employees held the largest share of jobs in the next three largest sectors, Energy Efficiency, Clean Transportation and Energy Storage, accounting for 41, 65 and 46 percent of sector employment, respectively. Energy efficiency is diverse in value chain activities and includes employment in manufacturing (41%), installation and services (23% each), and smaller portions in supplier, sales, and research & development.

Much of installation employment (81%) is in the Energy Generation sector, with the remainder primarily in Energy Efficiency. Energy Generation accounts for over 31 percent of all the research & development employment across the seven sectors. This is second only to Clean Transportation, which represents 34 percent of research & development employment.

The seven sectors are present in every region of California, although each region differs in its areas of specialization. In terms of employment, three regions, the Bay Area, the San Diego Region and the Sacramento Area, are more concentrated in these seven sectors than California's state average. The Bay Area contributes one third of California's jobs in the seven sectors, nearly 28,000 jobs. The next three highest contributors to the state's employment in the seven sectors are the Los Angeles Area, the San Diego Region and Orange County, representing 20, 14 and ten percent respectively. Job growth in the seven sectors between 1995 and 2010 has been faster than the California average in six regions, including the Sacramento Valley, the Sacramento Area, the Bay Area, the San Joaquin Valley, the Central Coast and Orange County. In the sections that follow, additional information is provided on regions with more than one thousand jobs across the seven sectors.

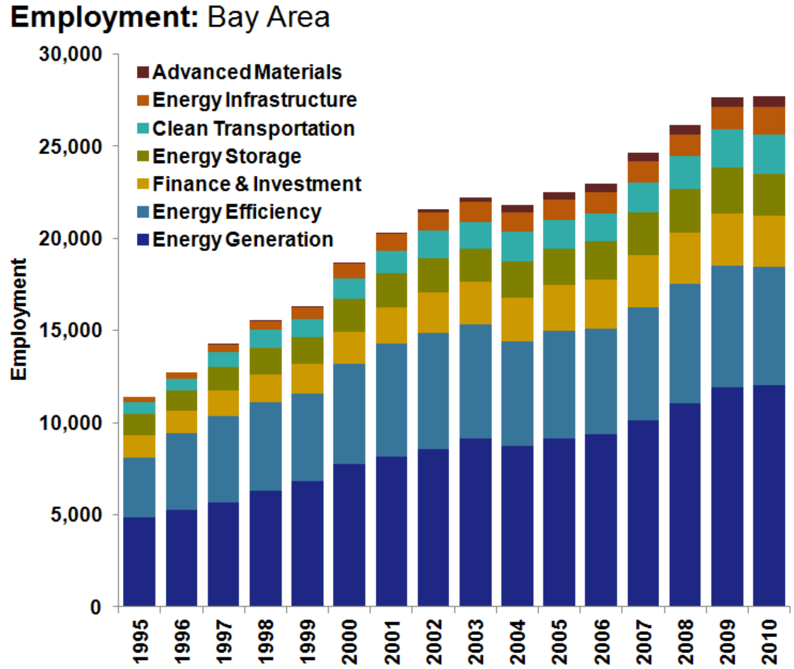

SEVEN GROWTH SECTORS OF CALIFORNIA'S CLEAN & EFFICIENT ECONOMY
Percent Change In Employment from 1995 to 2010
Employment Concentration by Region Relative to State, January 2010
2010 EMPLOYMENT CONCENTRATION SEVEN GROWTH SECTOR ECONOMY
(a value of 1.0 indicates employment concentration equal to the state average)
Less than 0.8
0.81 to 0.9
0.91 to 1.0
1.01 to 1.3
More than 1.3
NORTH COAST
-29%
SACRAMENTO VALLEY
+111%
SIERRA REGION
+72%
SACRAMENTO AREA
+167%
SIERRA REGION
+72%
BAY AREA
+143%
SAN JOAQUIN VALLEY
+133%
CENTRAL COAST
+169%
LOS ANGELES AREA
+76%
ORANGE COUNTY
+178%
INLAND EMPIRE
+65%
SAN DIEGO REGION
+73%
Datasource: Green Establlishments Database
Analysis: Collaborative Economics

REGIONAL OVERVIEWS

BAY AREA

While total Bay Area employment grew by six percent between 1995 and 2010, **Bay Area jobs in the seven sectors grew 143 percent**. In the last observable year, employment in these sectors remained stable, neither growing nor contracting, while total regional employment fell by seven percent.

Between 2009 and 2010, **Energy Generation employment increased by one percent**, while Energy Efficiency employment decreased by two percent. Between 1995 and 2010, these two sectors have grown jobs by 149 percent and 98 percent, respectively. Though Energy Infrastructure represents only five percent of the Bay Area's employment in the seven sectors, between 2009 and 2010, it grew by 23 percent, adding about 290 new jobs. Employment in Clean Transportation also grew during the depths of the economic downturn, increasing by about one percent between 2009 and 2010.

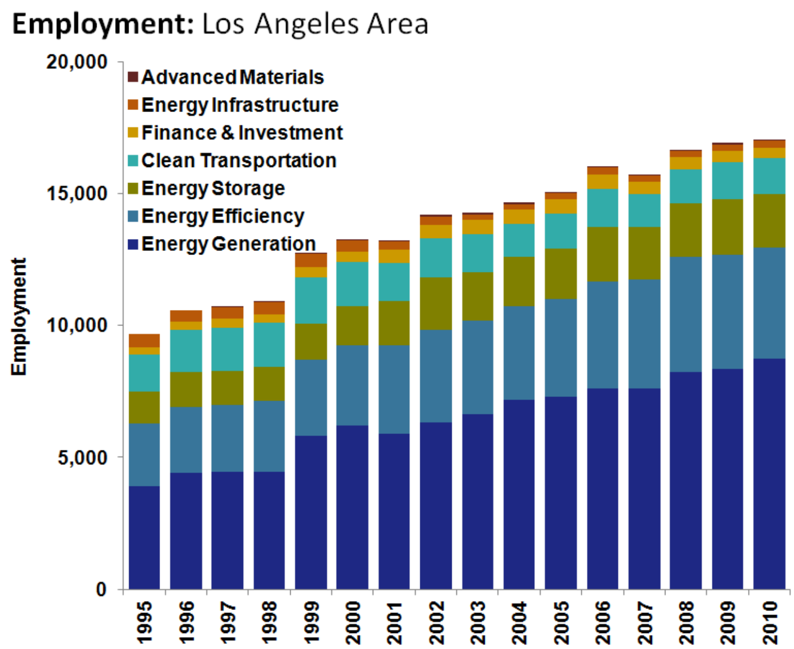


Data Source: Green Establishment Database. Analysis: Collaborative Economics

LOS ANGELES AREA

From 1995 to 2010, the **seven sectors have grown steadily in the Los Angeles Area**. Over the fifteen year period, the total number of jobs grew 76 percent, much faster than the regional economy as a whole, which inched up two percent. In fact, during the depths of the economic downturn between January 2009 and 2010, jobs in the seven sectors grew by one percent, while the region's overall employment dropped nine percent.

Over the long term, **there has been a rapid rise in the number of establishments in these sectors**—increasing by 119 percent from about 470 in 1995 to 1,030 businesses in 2010. While establishments did drop by eight percent between 2009 and 2010, it was due more to business consolidation than economic contraction, as jobs grew by one percent.



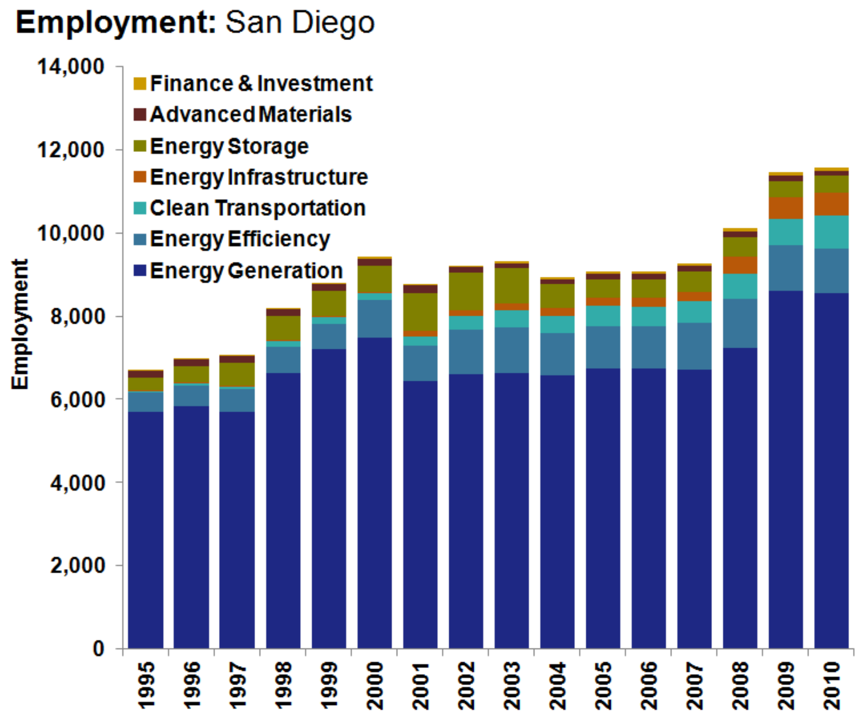
Data Source: Green Establishment Database. Analysis: Collaborative Economics

Energy Generation accounts for 51 percent of Los Angeles Area's seven-sector employment. Between 2009 and 2010, **Energy Generation increased by five percent** and gained 415 new jobs for the region. Energy Efficiency is the second fastest growing growth sector in the Los Angeles Area. Though Energy Efficiency experienced a three percent contraction in employment between 2009 and 2010, the sector has grown 77 percent, adding roughly 1,830 jobs since 1995. Finance & Investment accounts for four percent of the total seven – sector establishments – and has increased fourfold since 1995 from nine businesses to about 40 establishment's region-wide.

REGIONAL OVERVIEWS

SAN DIEGO

The San Diego Region is **one of California's most concentrated centers** of the seven sectors. From 2009 to 2010, the region's seven sectors experienced a one percent gain, faring better than the overall regional economy, which lost five percent of its employment. Between 1995 and 2010, employment in the seven sectors increased 73 percent, while total regional employment grew 26 percent.

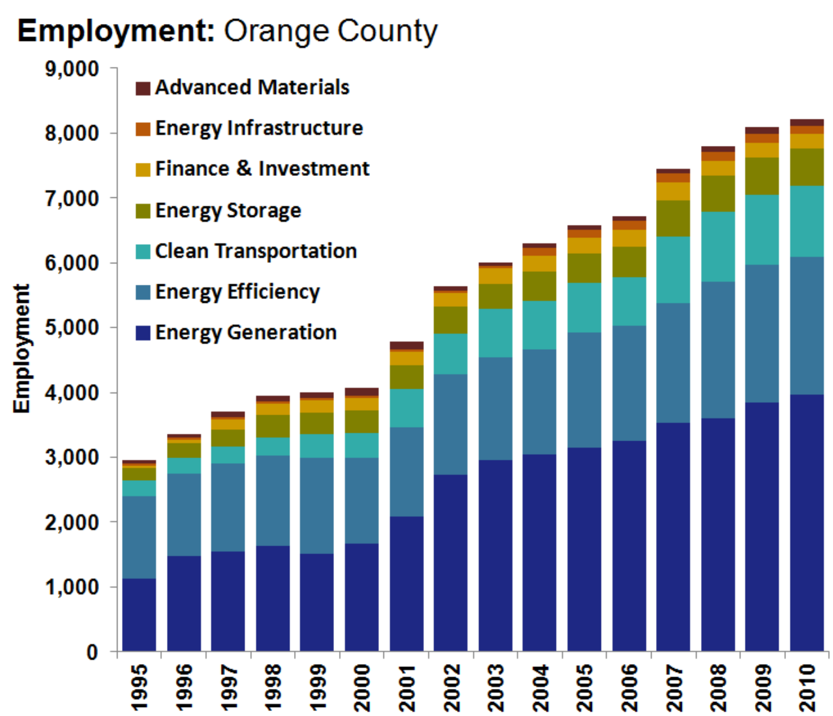


Data Source: Green Establishment Database. Analysis: Collaborative Economics

Much of the seven-sector job growth can be attributed to **Clean Transportation and Energy Infrastructure**, as these sectors grew by 28 percent and nine percent, respectively. The largest sector, Energy Generation, representing 74 percent of total seven-sector employment, dropped one percent. Though Finance & Investment experienced a nine percent decline in employment within the last observable year, the sector grew seven-fold over the last 15 years.

ORANGE COUNTY

Between 1995 and 2010, **employment in the seven sectors grew at a faster pace than any other region of the state**, recording a 178 percent increase in jobs. Over 5,250 jobs and 320 establishments have been added to the region's seven sectors. While Orange County's overall economy experienced job and establishment losses of nine and 16 percent, respectively, between 2009 and 2010; the county's seven sectors fared relatively well, gaining two percent in employment and experiencing a five percent loss in establishments.

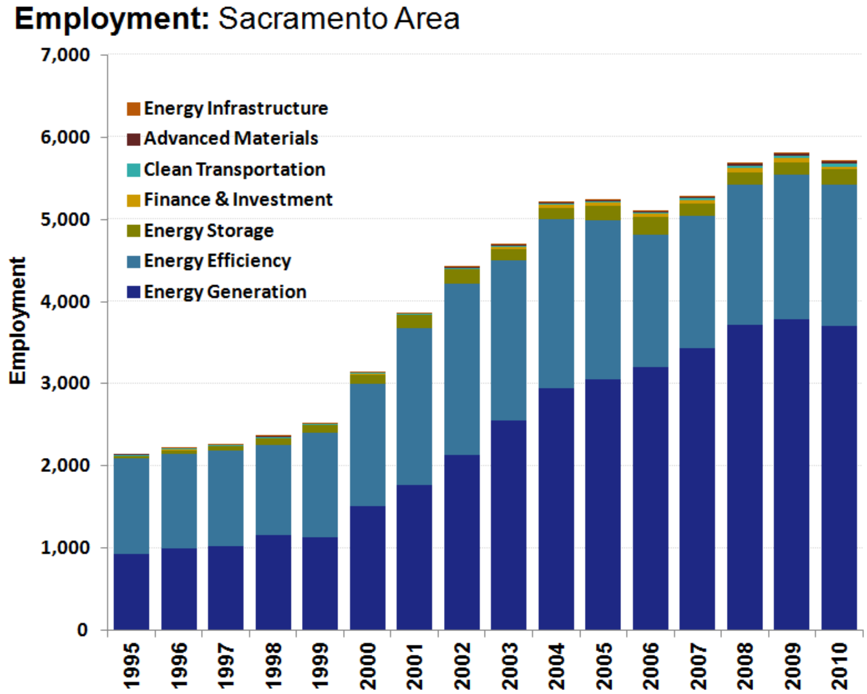


Data Source: Green Establishment Database. Analysis: Collaborative Economics

Energy Generation is the largest growth sector in Orange County (i.e., 48% of the total seven-sector employment in 2010) and has continued to consistently grow. Between 1995 and 2010, more than 2,800 jobs have been added to this sector.

Between 2009 and 2010, Energy Generation grew three percent, adding over 120 jobs to the region. **Energy Generation establishments have tripled** from 80 in 1995 to 270 in 2010, and remained fairly steady with a slight two percent increase between 2009 and 2010. Employment levels in Energy Efficiency, Clean Transportation and Energy Storage have remained relatively constant, with increases from one to two percent from 2009 to 2010.

SACRAMENTO AREA

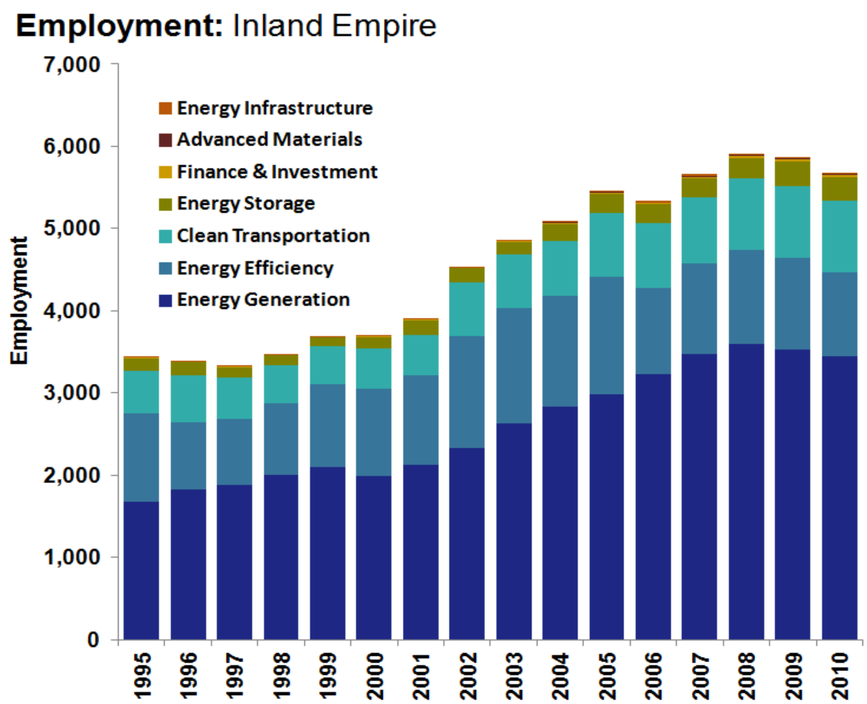


Data Source: Green Establishment Database. Analysis: Collaborative Economics

Between 1995 and 2010, the Sacramento Area's **seven sectors have experienced a 167 percent increase** in employment, outpacing the growth of the overall economy during this time (25%). During the depths of the economic downturn between 2009 and 2010, the region experienced a two percent employment drop in the seven sectors, compared to a four percent job loss in the regional economy as a whole.

Energy Generation and Energy Efficiency combined make up 95 percent of seven-sector employment and 89 percent of seven-sector establishments in the Sacramento Area. Both sectors lost a combined four percent of employment between 2009 and 2010. Other growth sectors such as Clean Transportation and Energy Infrastructure have remained stable, neither losing nor gaining jobs. And, despite the economic downturn, Energy Storage experienced substantial growth between January 2009 and 2010, expanding employment by 18 percent. Over the course of 15 years, this sector has grown from three businesses in 1995 to nearly 20 businesses in 2010, creating close to 160 new jobs in the region.

INLAND EMPIRE



Data Source: Green Establishment Database. Analysis: Collaborative Economics

Between 1995 and 2010, the Inland Empire has **experienced growth** in both the overall economy and in the seven sectors. As jobs in the overall regional economy expanded by 41 percent, employment in the seven sectors grew by 65 percent, adding more than 2,200 jobs.

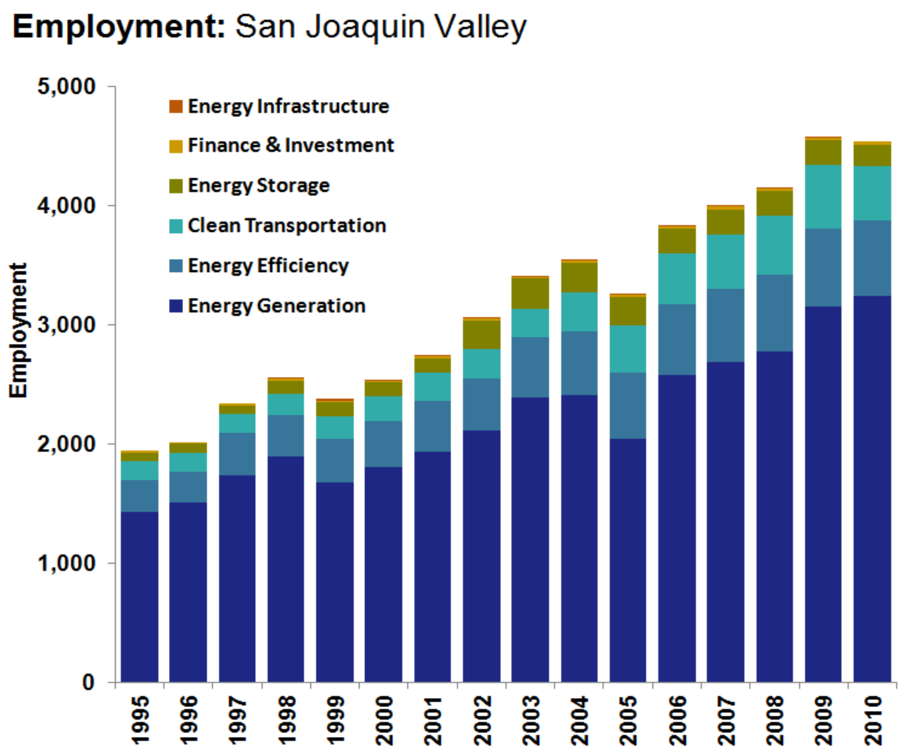
During the depths of the economic downturn between 2009 and 2010, the seven sectors in the Inland Empire lost about 200 jobs. Energy Generation and Energy Efficiency, which make up over 80 percent of the region's seven-sector employment, have experienced job losses of two and nine percent, respectively. **Clean Transportation** was the only growth sector that increased employment between 2009 and 2010, adding a handful of new jobs to the region.

REGIONAL OVERVIEWS

SAN JOAQUIN VALLEY

Between 1995 and 2010, jobs in the **seven sectors in the San Joaquin Valley grew 133 percent**, with establishments increasing by 128 percent. During the economic downturn (between 2009 and 2010), jobs in the seven sectors dropped by one percent, compared to a bigger decline of four percent in the region's overall economy.

Jobs in **Energy Generation** (in 2010, 71 percent of the seven-sector employment in the region) actually increased by three percent between 2009 and 2010, adding nearly 100 new jobs. Over the long term, Energy Generation employment has grown 126 percent, from about 1,400 jobs in 1995 to over 3,200 jobs in 2010. Employment in Clean Transportation nearly tripled from1995 to 2010, despite a contraction of 14 percent between 2009 and 2010.



Data Source: Green Establishment Database. Analysis: Collaborative Economics

APPENDIX

Seven Growth Sectors: Employment					
	1995	2009	2010	% Change 95-10	% Change 09-10
Energy Generation	21,069	46,086	46,555	121%	1%
Energy Efficiency	10,232	18,142	17,670	73%	-3%
Clean Transportation	3,128	6,756	6,837	119%	1%
Energy Storage	3,381	6,632	6,336	87%	-4%
Finance & Investment	1,496	3,699	3,559	138%	-4%
Energy Infrastructure	839	2,190	2,489	197%	14%
Advanced Materials	212	861	894	322%	4%

SEVEN GROWTH SECTORS: GREEN BUSINESS ESTABLISHMENTS DATABASE

Collaborative Economics Inc. (CEI) has developed an approach for identifying and tracking the growth of businesses with primary activities in the seven growth sector economy. This methodology was originally developed for work carried out on behalf of Next 10, a California-based nonprofit, and published in the California Green Innovation Index (2008, 2009, 2010, and 2012). Building on this work, CEI designed and conducted the nationwide analysis of green business activity on behalf of the Pew Charitable Trusts. The Pew Center on the States reformatted the results of the analysis and developed the report, The Clean Energy Economy (June 2009).

The accounting of green business establishments and jobs is based on multiple data sources (including New Energy Finance and the Cleantech Group™ LLC) for the identification and classification of green businesses and also leveraged a sophisticated internet search process. Collaborative Economics designed the parameters of the internet search platform which was engineered by PlanetMagpie, a Bay Area-based IT service company. The National Establishments Time-Series (NETS) database based on Dun & Bradstreet business-unit data was sourced to extract business information such as jobs. This sample offers a conservative estimate of the Seven Growth Sector industries. The jobs numbers reported in the database reflect all jobs at each business location. In the case of multi-establishment companies, only the Seven Growth Sector establishments are included. While this approach does not examine specifically green occupations that are appearing across the entire economy (such as Chief Sustainability Officer), it does account for the businesses behind the products and services that these new professionals need to use in their jobs (such as advanced metering devices, co-generation equipment, and various high efficiency materials).

The multilayered process involves both automated and manual verification steps of business establishments and their activities. In cases where the results were uncertain and the activities of a business establishment could not be verified, the establishment was dropped from the database. Therefore, the database offers a conservative estimate for the numbers of establishments and jobs in the seven growth sector economy.