



PRESIDENT'S CORNER

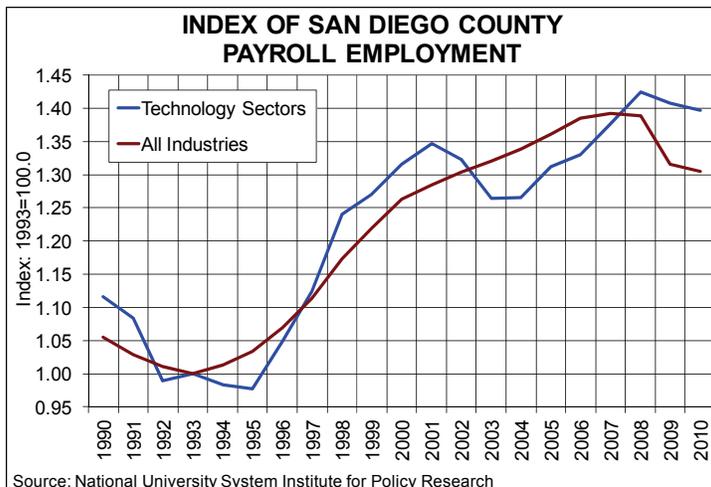
San Diego's efforts to attract, nurture, and support a diversified technology industry stretch back at least 50 years and are one of the great success stories in modern American economic development. It is often a difficult narrative to understand. Unlike some regions where you can point to a few people making a decision to build a business park (Research Triangle) or win in attracting a semiconductor research lab (Austin), San Diego is the story of hundreds of individuals making thousands of choices which, combined, created the most geographically concentrated biotechnology region in the country, leading technology firms in several areas of IT, and a collaborative research and development community that has a demonstrated comparative advantage moving ideas from the lab bench to the market place.

As NUSIPR Senior Economist Kelly Cunningham makes clear in this issue of the Economic Ledger, San Diego's technology sectors overall have fared far better than other areas during the most recent downturn. Whereas unemployment is pronounced in areas like real estate, construction, and non-technology manufacturing, San Diego's life science, defense, and information technology firms have experienced job gains during a period in which overall employment is down by more than 100,000 jobs.

Challenges remain. These industries are highly coveted by other regions, and firms and researchers in San Diego

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San Diego High-Tech Economy Dynamics



Source: National University System Institute for Policy Research

San Diego's primary economic drivers have changed significantly over the past twenty years. Various technology sectors emerged as their growth largely fueled other employment and growth throughout the region. In the process, San Diego garnered a reputation among the nation's leaders in areas of knowledge and innovative research and development technology.

Perhaps most notably and importantly, the recession has not reversed this trend. Although current economic challenges have not left technology work unscathed, these sectors have far outpaced other segments of the economy as technology-driven businesses remain highly sought throughout the nation and around the world. The industries create high-value jobs and significantly nurture and bolster the region's vitality and overall economic prosperity.

For that reason, San Diego should continue to actively strengthen the economic conditions that nurture these key high wage, high value added drivers of regional employment.

The National University System

Institute for Policy Research developed a methodology to measure San Diego's technology employment utilizing publicly reported state employment data. This measurement serves to chronicle San Diego's strengths among these diverse and evolving sectors of high-technology.

National leader in technology

The Milken Institute described San Diego as "an important high-tech center with the world's most geographically dense biotech cluster, an enviable position in telecom hardware and services, and strong representation in several fields."¹ At the time of the study (2007) San Diego was cited as the 7th most prominent high-tech/knowledge-based metro area in the nation, and the region was listed among the top ten metro areas in four specific sectors for high-technology. San Diego was noted as first in "scientific research and development services" and in "audio and video equipment manufacturing" (largely because of close connections to Baja California factories).

This transformation has in

many ways fundamentally altered a key dynamic of San Diego's economy. Military activities, including direct expenditures by the Federal government and defense-based manufacturing had been the primary driver of San Diego's regional economy since at least World War II. This has often meant that San Diego experienced booms, followed by serious and debilitating busts. More recently, the end of the Cold War and resulting cut-backs in defense and aerospace spending in the early 1990s led San Diego into a severe and lingering recession. With the substantial loss of aerospace jobs, technology employment bottomed out in 1995, as shown by the index in the above chart.

Yet even as the long-standing pillars of the San Diego economy, with General Dynamics laying off tens of thousands of aerospace workers, San Diego's knowledge-based sectors were transforming themselves and gaining competitive advantages in a number of other, although oftentimes related, non-defense commercial areas. The concentration of knowledge-based industries, including information and communications technology, biopharmaceuticals, medical devices, and other tech sectors, created high-paying jobs, attracted and retained talented individuals in the region, and led to creation, development and attraction of technology firms sparking additional growth throughout the region.

Technology employment increased by 36,511 jobs between 1995 and 2001, a 38 percent gain compared to 23 percent increase among non-

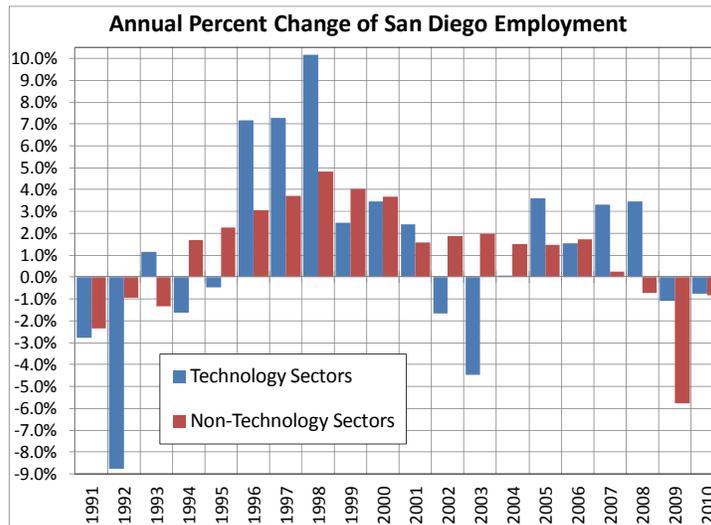
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tech jobs over the same period. Both private and government spending fueled this emergence resulting in much greater economic power, diversity and lower vulnerability to the economic shocks that had regularly occurred within a much narrower range of industry.

There were challenges along the way. During the early 2000s cheap capital seemed available for any company with a logo involved in the internet. While San Diego did not quite experience the level of “froth” found in areas such as Silicon Valley, the “dot com bust” resulted in San Diego’s technology employment declining. Tech employment fell 6.1 percent between 2001 and 2003, while non-tech jobs otherwise increased another 3.9 percent.

Beginning in 2004 tech employment began rising again, led by defense, particularly among ship repair and builders, unmanned aerial vehicles (UAV), and defense information technologies. Other strengths were seen in telecommunications, software, and further



emergence of the biotech sector. During this time technology employment increased 12.5 percent until a peak in 2008, more than quadrupling non-tech job growth of 3.0 percent.

The Great Recession

The impact of the 2007-2009 Great Recession has been dramatic and pronounced. The economic downturn will likely take several additional years before regional employment once again reaches former peak levels.

In contrast to the previous two recessions, however, technol-

ogy employment in San Diego held up much better than the overall economy. Investment funding for San Diego’s research and development efforts held up relatively better, as companies endeavor to retain their highly skilled workforces even as the economy otherwise faltered and employment overall fell.

As of 2010, technology companies number 6,023 in San Diego, accounting for 6.2 percent of all employers (with payrolls). Slightly down as a percentage of total establishments since a peak in 2007,

the proportion of technology companies in San Diego remains far greater than two decades ago. The higher number of tech companies and greater proportion of local businesses reflects the proliferation of small start-ups and highly entrepreneurial businesses arising over the past 20 years, as well as the increasing diversity of the region’s technology sectors.

In respect to payroll and employment, there are interesting dynamics going on that tell us much about San Diego’s economic strengths, and also going-forward challenges. Despite the increase in number of tech companies, technology jobs as a percentage of total employment over the past two decades has remained relatively steady varying consistently between 10 and 11 percent of total employment. The 11.1 percent of tech jobs to total employment in 1990 is about the same as 11.2 percent in 2010.

Payrolls of San Diego technology companies, on the other hand, at 20.8 percent in 2010 account for a larger proportion of total payrolls. This is due to the much higher average wages paid by technology companies. Annual wages among technology companies in 2010 average \$93,800, 86 percent higher than San Diego’s overall average of \$50,500. Separating technology from the total, the average among non-technology companies is actually only \$45,000, less than one-half technology company averages. This suggests a major contributing factor to growing income disparities in San Diego are the wage premiums paid to technology workers who contribute to significant increases in productivity. Technology industries have much higher value added per worker.

Inside the Numbers: Multiplier Impacts

The economic impact in terms of jobs, income, and dollars generated by technology businesses also significantly sustains other economic activity throughout the region.

SAN DIEGO TECHNOLOGY INDUSTRY COMPARED WITH ALL ESTABLISHMENTS

Year	Establishments		Employment		Total Payrolls		Avg. Annual Income	
	Tech- nology	All Indus- tries	Per- cent of Tech- nology	Per- cent of Total	Tech- nology (\$ millions)	Per- cent of Total	All Indus- tries (\$ millions)	Per- cent of Total
1990	1,935	53,853	3.6%	11.1%	\$3,930.1	16.4%	\$23,946.5	149%
1991	2,323	64,336	3.6%	11.0%	4,015.6	16.3%	24,608.7	148%
1992	2,480	69,166	3.6%	10.2%	3,967.5	15.8%	25,158.9	154%
1993	2,624	70,671	3.7%	10.5%	4,085.6	16.2%	25,284.3	155%
1994	2,728	67,766	4.0%	10.2%	4,155.7	15.8%	26,304.8	155%
1995	3,041	72,454	4.2%	9.9%	4,359.3	16.0%	27,285.9	162%
1996	3,173	70,029	4.5%	10.3%	4,935.4	16.8%	29,291.3	164%
1997	3,236	67,170	4.8%	10.6%	5,626.1	17.5%	32,201.6	165%
1998	3,684	73,662	5.0%	11.1%	6,570.1	18.3%	35,892.4	166%
1999	3,968	76,455	5.2%	10.9%	8,388.6	20.9%	40,139.1	192%
2000	3,941	73,232	5.4%	10.9%	9,606.9	21.4%	44,909.1	196%
2001	4,230	75,348	5.6%	11.0%	9,359.8	20.0%	46,830.6	182%
2002	4,554	79,408	5.7%	10.6%	9,204.5	18.9%	48,627.5	178%
2003	4,734	83,354	5.7%	10.0%	9,292.1	18.3%	50,732.0	183%
2004	4,876	85,621	5.7%	9.9%	10,134.4	18.8%	53,839.7	190%
2005	4,998	86,553	5.8%	10.1%	10,698.0	18.9%	56,615.8	188%
2006	5,886	91,732	6.4%	10.1%	11,512.6	19.1%	60,157.4	190%
2007	5,978	91,960	6.5%	10.3%	12,405.8	19.7%	62,964.6	190%
2008	5,906	97,453	6.1%	10.7%	13,408.0	20.7%	64,650.3	193%
2009	5,990	96,716	6.2%	11.2%	12,760.1	20.8%	61,444.9	186%
2010	6,023	97,114	6.2%	11.2%	13,019.0	20.8%	62,514.6	186%

Source: National University System Institute for Policy Research, based upon California Employment Development Department, Quarterly and Annual Census of Employment & Wages (ES 202).

According to economic modeling, the 138,800 jobs employed by technology companies in 2010 indirectly accounted for 103,800 more jobs, and induced another 120,400 local jobs. Thus total direct, indirect and induced employment traced to technology companies sustains an estimated 363,000 workers or 29.3 percent of all San Diego jobs.²

Accordingly, labor income directly generated by technology industry employment in 2010 reached \$15.7 billion. Indirect and induced income added another \$12.3 billion, totaling \$28.0 billion or 45 percent of total regional labor income.

upon public payroll employment data published by the state of California reporting industries by NAICS defined categories. (For more information on the methodology used to define San Diego's technology sectors, see the Appendix at the end of this report.)

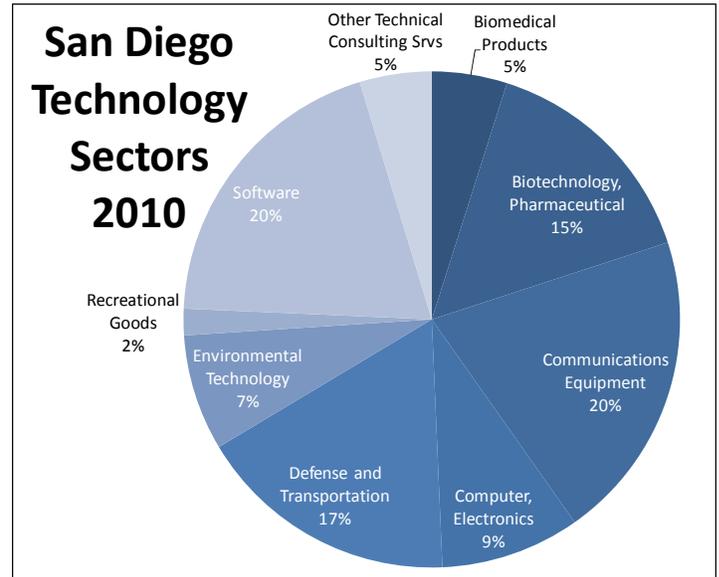
Communications equipment: This category includes 870 companies providing telecommunications services or direct support for service providers, cable, satellite television broadcasting, and Internet service providers. This also includes the manufacturing of telephone apparatus, radio and television broadcasting equipment, and

various wireless communications equipment, including mobile and smart phones.

Qualcomm is San Diego's largest and most prominent telecommunications employer, while *AT&T*, *Kyocera Wireless*, *ViaSat*, and *Leap Wireless* are also major players.³ Although employment has fallen since

2008, more than 28,000 were employed in San Diego as of 2010 and retains the highest number of jobs among local tech sectors.

Software: Software employers totaled 2,016 as of 2010, more than one-third of all San Diego technology companies. This encompasses businesses fo-



cused on publishing and re-copying computer programs, or fully engaged in the developing processes of designing, documenting, supporting, and publishing computer software. This includes firms hosting websites and various Internet portals. The category also includes customized operating systems design, planning and designing of computer systems hardware, on-site systems and data management, and consulting and support for such systems.

Mitchell International is the largest local software employer providing insurance industry services, while *Websense* and *Eset* are prominent software firms providing internet security. This sector has grown significantly and fairly consistently in San Diego over the past twenty years from 12,600 jobs in 1990 to 27,200 as of 2010. The growth was largely prolifer-

ated by small, homegrown entrepreneurial companies.

Defense - aerospace and transportation: This industry consists of 203 companies primarily engaged in manufacturing aircraft, guided missiles, aerospace parts such as engines and propulsion units, and development of aircraft prototypes. San Diego also remains the only major shipbuilder on the west coast capable of building, maintaining, and repairing large ships. *Northrop Grumman* and *General Atomics* are leading aerospace firms, while *General Dynamics/NASSCO* and *BAE Systems Ship Repair* are the largest shipbuilders.

Following the collapse of aerospace manufacturing in the first half of the 1990s, when employment fell from more than 40,000 to less than 20,000, job numbers were relatively stable until increased defense spending reemerged with the onset of the Afghanistan and Iraq conflicts. Employment has apparently peaked again in 2008 at 25,500, before faltering somewhat to 23,700 as of 2010. Further downsizing may occur as the conflicts wind down and the U.S. government is anticipated to cut defense expenditures in upcoming years.

This sector does not encompass many more San Diego firms receiving reve-

ECONOMIC IMPACT OF SAN DIEGO TECHNOLOGY INDUSTRIES, 2010

	Employment	Labor Value Added (\$billions)	
		Income	Added
Direct Impact	138,758	\$15.70	\$20.25
Indirect Impact	103,838	\$6.82	\$10.87
Induced Impact	120,394	\$5.50	\$10.38
TOTAL Technology	362,991	\$28.02	\$41.50
Multiplier	2.62	1.78	2.05
Percent of Total	29.3%	44.8%	24.2%
Overall San Diego economy	1,237,795	\$62.51	\$171.57

Source: National University System Institute for Policy Research, based upon IMPLAN model for San Diego.

The value from economic production directly added by technology establishments is estimated to be \$20.2 billion. Indirect and induced impacts generated another \$21.3 billion, for total output of \$41.5 billion. The economic value of technology companies added to the regional economy in 2010 thus accounts for 24.2 percent or nearly one in every four dollars generated in San Diego's \$171.6 billion gross regional product.

Diversity of San Diego's Technology Sectors

Life sciences, software, communications and defense/transportation dominate the local technology landscape. The *National University System Institute for Policy Research*, in conjunction with *CONNECT*, developed a measurement of technology employment by sectors in San Diego. The measurement is based

SAN DIEGO TECHNOLOGY INDUSTRIES, 2010

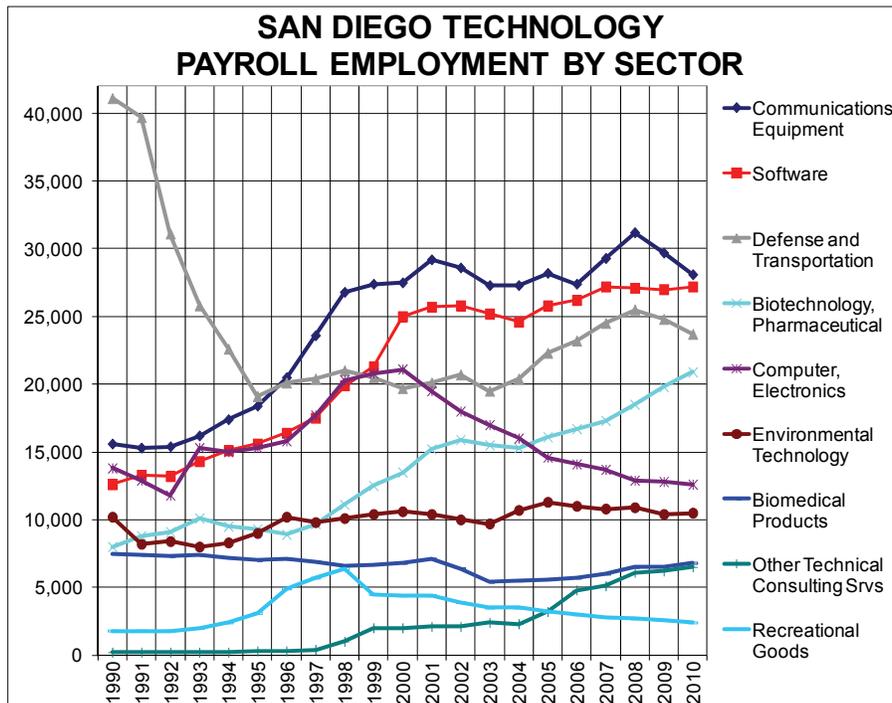
Sector	Estab-lishments	Employ-ment	Payroll (\$millions)	Average Income
Technology Industry, Total	6,023	138,758	\$13,019.0	\$93,800
Biomedical Products	191	6,824	530.6	77,800
Biotechnology & Pharmaceutical	396	20,879	1,985.5	95,100
Communications Equipment	870	28,085	2,938.1	104,600
Computer & Electronics	201	12,600	1,187.0	94,200
Defense and Transportation	203	23,738	2,136.3	90,000
Environmental Technology	457	10,505	802.2	76,400
Recreational Goods	77	2,435	160.5	65,900
Software	2,016	27,223	2,720.1	99,900
Other Technical Consulting Services	1,612	6,469	558.7	86,400
Overall Employment	97,114	1,237,795	\$62,514.6	\$50,505
Non-technology Sectors	91,091	1,099,037	49,495.6	45,000

Source: National University System Institute for Policy Research, based upon California Employment Development Department, *Quarterly and Annual Census of Employment & Wages (ES 202)*.

nue from the Department of Defense. *Science Applications International Corporation* (SAIC), for example, is a prominent defense contractor providing a wide range of other technical services and applications for the military. Defense work is a prominent component for scores of other local companies providing computer, electronics, communications, software, and life sciences.

Biotechnology and pharmaceutical: San Diego's biotech network contains a closely knit yet wide ranging assortment of 396 biotechnology and pharmaceutical companies. Establishments are primarily engaged in conducting research and experimental development of life sciences, attracting significant venture capital and other investment dollars in a burgeoning network of research and development endeavors.

San Diego is home to major biotech firms *Amylin Pharmaceuticals*, *Invitrogen*, and *Illumina*, as well as many other mid-sized and start-up firms. Well known and highly-regarded research institutions include *Scripps Research Institute*, *Salk Institute for Biological Studies*, *Burnham Institute*, and *Neuroscience Institute* are located in the area as well. Local biotech efforts receive a



disproportionate share of NIH funding,, *National Science Foundation* basic research funding, *Small Business Innovation Research Awards*, and *Small Business Technology Transfer* awards.

Employment among local biotechnology/pharmaceutical businesses has grown significantly over the past two decades, rising through the second half of the 90s, slumping slightly in the early 2000s, before and vigorously rebounding through the rest of the decade, even during the onset of the deep recession.

Biomedical equipment and supplies manufacturing: This related industry comprises another 191 establishments primarily engaged in manufac-

turing laboratory apparatuses, surgical and medical instruments, and dental equipment and orthodontic goods. *GenProbe* and *Life Technologies* are among the region's more prominent biomedical developers.

The *Milken Institute* indicates Baja California is home to another sixty companies manufacturing medical equipment, of which more than forty were divisions of U.S. firms, and thirteen were subsidiaries of San Diego-based companies or corporate divisions.⁴

Computer and electronics: This industry involves 201 firms manufacturing a wide range of specialized equipment and assembly of electronic devices. This includes mainframes, per-

sonal computers, and servers, as well as peripheral hardware such as storage devices, printers, and monitors. Capacitors, resistors, microprocessors, circuit boards, electron tubes, and modems among the many products manufactured.

After rising significantly through the 90s, employment within this sector slumped considerably in the 2000s as manufacturing processes relocated to less expensive areas outside of California and often to off-shore locations. Employment in San Diego fell from 21,100 in 2000 to 12,600 by 2010, losses appearing slow more recently. Some production relocated directly across the border to Baja California. Employers such as *Honeywell*, *Sanyo*, and *Sony* significantly boosted manufacturing operations of semiconductors and other electronic components to their Mexican factories.

Environmental technology: This sector involves 457 companies developing products and services involved in improving energy efficiency, expanding the use of renewable energy sources, and supporting environmental sustainability. While there has been considerable discussion surrounding this sector, job gains have been somewhat muted in San Diego.

TECHNOLOGY PAYROLL EMPLOYMENT BY SECTOR IN SAN DIEGO COUNTY

Employment Sector	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Technology Total*	130,600	133,700	131,400	125,500	125,600	130,300	132,100	136,700	141,400	139,800	138,700
Biomedical Products	6,800	7,100	6,400	5,400	5,500	5,600	5,700	6,000	6,500	6,500	6,800
Biotechnology, Pharmaceutical	13,500	15,200	15,900	15,500	15,300	16,100	16,700	17,300	18,500	19,800	20,900
Communications Equipment	27,500	29,200	28,600	27,300	27,300	28,200	27,400	29,300	31,200	29,700	28,100
Computer, Electronics	21,100	19,500	18,000	17,000	16,000	14,600	14,100	13,700	12,900	12,800	12,600
Defense and Transportation	19,700	20,100	20,700	19,500	20,400	22,300	23,200	24,500	25,500	24,800	23,700
Environmental Technology	10,600	10,400	10,000	9,700	10,700	11,300	11,000	10,800	10,900	10,400	10,500
Recreational Goods	4,400	4,400	3,900	3,500	3,500	3,200	3,000	2,800	2,700	2,600	2,400
Software	25,000	25,700	25,800	25,200	24,600	25,800	26,200	27,200	27,100	27,000	27,200
Other Tech Consulting Services	2,000	2,100	2,100	2,400	2,300	3,200	4,800	5,100	6,100	6,200	6,500
Overall Payroll Employment	1,198,800	1,219,000	1,237,200	1,253,000	1,270,400	1,291,900	1,313,900	1,321,200	1,317,300	1,247,900	1,237,800
Non-technology Sectors	1,004,300	1,011,200	1,020,500	1,036,000	1,056,200	1,075,900	1,096,600	1,101,100	1,094,900	1,026,700	1,014,100

*Technology employment derived from California Employment Development Department "Quarterly and Annual Census of Employment and Wages" (QCEW) program data. Technology sectors determined from aggregated North American Industrial Classification System (NAICS) codes.

Source: National University System Institute for Policy Research.

(Note: this only refers to environmental development technologies, and not jobs that may be considered clean/green/environmentally connected, such as solar panel installers or retail distributors, for example.)

Nevertheless, the industry has attracted significant investment dollars to the region and sustains an important segment of local employment numbering 10,505 as of 2010. It should also be noted that the significant environmentally connected development of algae-to-biofuels research could also be considered part of this sector, but is already included under biotechnology.

Recreational goods: San Diego leads the nation in employment for recreational goods manufacturing primarily because of the major golf club manufacturers located here, including *TaylorMade-adidas*, *Callaway*, *Acushnet*, and *Aldila*. Other relatively small surf board, skateboards, and other recreational goods manufacturers make up the rest of the 77 such firms.

After strong growth in the jobs during the '90s, employment subsequently dwindled, along with other area manufacturing, to more affordable off-shore locations. Employment in this sector as of 2010 numbers only 2,400.

Other technical consulting services: The final segment of technology business in San Diego comprises 1,612 establishments primarily engaged in

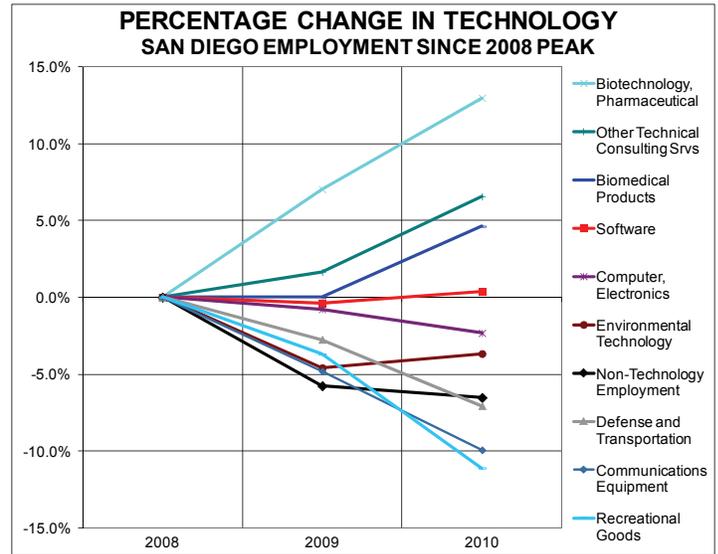
providing advice and assistance to businesses and other organizations for scientific and technical issues. These employers are relatively small businesses offering a grab bag of technology services and resources. Employment has grown significantly in San Diego over the past decade numbering 6,500 jobs as of 2010.

APPENDIX: Methodology for technology sector data definitions

In consultation with *CONNECT*, the *National University System Institute for Policy Research* utilizes nine sectors to define San Diego's technology-centric industries. The measurement of San Diego's technology employment numbers are published quarterly in *CONNECT's* Innovation Report. (See <http://www.connect.org/>)

The measurement of technology companies and employment is based upon the *California Employment Development Department's* (EDD) "Quarterly and Annual Census of Employment & Wages" (QCEW). Technology sectors are designated by an aggregation of NAICS categories by industry. The EDD data is compiled from reports filed by employers providing a count of employment and wages for workers covered by unemployment insurance programs.

The QCEW program (formerly known as the ES-202 program) is a cooperative program involving the Bureau of Labor Statistics (BLS) of the U.S. De-



partment of Labor and the State of California EDD's (EDD) Labor Market Information Division (LMID). This data is the most complete universe of monthly employment and quarterly wage information by detailed industry at the national, State, MSA, and county levels and has broad economic significance in evaluating labor market trends and major industry comparisons.

The QCEW program serves as a near census of monthly employment and quarterly wage information by NAICS industry. At the State and local area level, the QCEW program publishes employment and wage data down to the 6-digit NAICS industry level, if disclosure restrictions are met. In accordance with BLS policy, data provided to the Bureau in confidence are not published and

used only for specified statistical purposes.

It should be noted that companies and their employment and payrolls are assigned by EDD to designated NAICS categories. Although the NAICS categories of technology sectors are consistent back to 1990, EDD may reassign company designations if core businesses are found to have significantly evolved. Modifications of NAICS categories have occurred as well. Therefore variances in establishments and employment counts may account for some of the changes over the years.

¹Ross C. DeVol, Kevin Klowden, Armen Bedroussian, and Benjamin Yeo, "North America's High Tech Economy", Milken Institute, 2009, p. 6.

²Direct, indirect, and induced economic impacts are estimated using the IMPLAN model for San Diego. IMPLAN (IMpact analysis for PLANning) is an "input-output"

MULTIPLIER IMPACTS OF SAN DIEGO TECHNOLOGY INDUSTRIES BY SECTOR

Sector	Employment				Labor Income (\$billions)				Total Value Added (\$billions)			
	Direct	Indirect/ Induced	Total Impact	Multi-plier	Direct	Indirect/ Induced	Total Impact	Multi-plier	Direct	Indirect/ Induced	Total Impact	Multi-plier
Technology Industry, Total	138,758	224,232	362,991	2.62	\$15,701.0	\$12,317.3	\$28,018.3	1.78	\$20,245.8	\$21,254.2	\$41,500.0	2.05
Biomedical Products	6,824	9,342	16,166	2.37	777.6	504.3	1,281.9	1.65	1,077.4	885.4	1,962.8	1.82
Biotechnology, Pharmaceutical	20,879	33,163	54,042	2.59	2,455.9	1,847.3	4,303.2	1.75	2,724.4	3,121.9	5,846.3	2.15
Communications Equipment	28,085	55,837	83,922	2.99	3,751.8	3,102.4	6,854.2	1.83	6,170.7	5,567.5	11,738.1	1.90
Computer & Electronics	12,600	28,953	41,553	3.30	1,576.2	1,749.4	3,325.6	2.11	1,753.3	2,879.9	4,633.2	2.64
Defense and Transportation	23,738	42,778	66,516	2.80	2,802.0	2,378.3	5,180.3	1.85	3,427.2	3,965.7	7,392.9	2.16
Environmental Technology	10,505	12,163	22,668	2.16	877.6	652.3	1,529.9	1.74	954.6	1,125.4	2,080.0	2.18
Recreational Goods	2,435	2,786	5,221	2.14	249.1	148.2	397.3	1.60	338.3	265.2	603.5	1.78
Software	27,223	32,148	59,372	2.18	2,655.2	1,583.8	4,239.0	1.60	3,118.9	2,841.9	5,960.7	1.91
Other Tech Consulting Services	6,469	7,061	13,530	2.09	555.6	351.3	906.9	1.63	681.2	601.3	1,282.5	1.88
Technology % of All Industries	11%	18%	29%		25%	20%	45%		12%	12%	24%	
Overall San Diego	1,237,795				\$62,514.6				\$171,568.0			

Source: National University System Institute for Policy Research, based upon California Employment Development Department, Annual Census of Employment & Wages; Multipliers based upon IMPLAN model for San Diego.

President's Corner

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receive frequent overtures from other areas seeking to replicate the region's success. But perhaps an even greater threat lies in more global factors. If it is the case, as many have argued, that the life cycle of products is becoming even more compressed, than San Diego firms needs to be ever focused on increasing the pace of innovation. Investments in education, infrastructure and basic science are critical in helping regional firms maintain their edge. This issue of the Ledger suggests just how important such efforts are in ensuring that San Diego remains a critical leader in technology and the knowledge economy.

— *W. Erik Bruvold, President National University System Institute for Policy Research*

Technology Sectors

(Continued from page 5)

model measuring the level of connectivity between firms in various industries. Impacts are referred to as “multiplier” or “indirect/ induced” impacts by various technology sectors within the regional economy. At IMPLAN's core is a statistical model of how change in demand in one sector of a regional economy creates impacts on other sectors. IMPLAN provides two kinds of second order effects from initial economic changes, indirect economic impacts and induced economic impacts. Indirect impacts reflect the spending the original suppliers make when purchasing goods and services from subsequent generations of firms to meet the demand generated from the original entity.

Dashboard Observations—August 2011

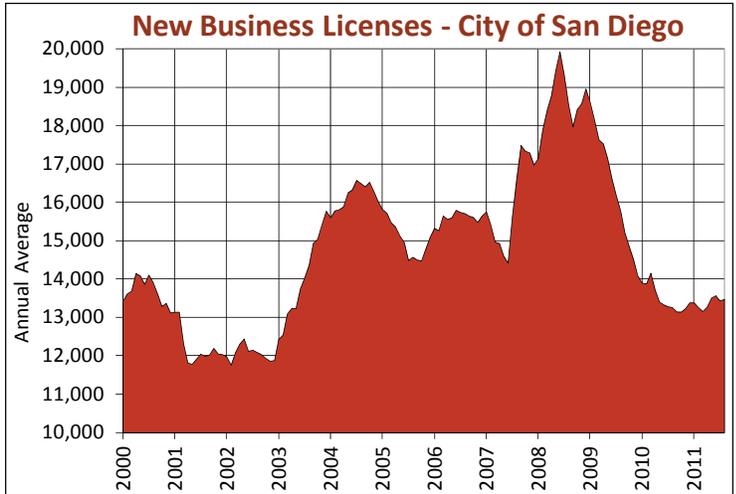
By Kelly Cunningham, Economist, Senior Fellow

San Diego “dashboard” indicators of economic activity mostly slumped in August 2011 from the previous month. There were improvements from levels seen in August 2010. The one “relative” positive for the month was the unemployment rate of 10.2 percent decreased from the year's high of 10.6 percent in July. The rate was also down from 10.7 percent recorded last August.

Although residential units authorized for construction in August were down from July, the year to date figure remains ahead of last year's pace. The improvement over both 2010 and 2009, however, compares the two lowest years for residential construction in San Diego in more than 70 years, since before World War II. At the pace of construction recorded so far in 2011, it will be close as to whether the year will end up exceeding the third lowest year of residential construction recorded in 2008 when only 5,357 units were approved. If the recession has taught us anything it is that housing development remains an important part of San Diego's economy and a critical part of the jobs engine for the region.

New business licenses issued by the City of San Diego were off slightly in August, but show some improvement over levels

Induced impacts are the economic impacts created by the spending of the additional income created by the new economic activity. These can be ex-



Indicator	Aug 2011	Month Change (Sea. Adj.)	Annual Change
Unemployment Rate ¹ San Diego County	10.2%	-0.1% ▲	-0.5% ▲
Residential Building ² Units authorized for construction San Diego County	271	-54.6% ▼	23.2% ▲
New Business Licenses ³ Issued by City of San Diego	1,138	-2.0% ▼	4.1% ▲
San Diego Stock Index ⁴ San Diego based companies	114.5	-14.6% ▼	7.4% ▲

¹California Employment Development Department.

²U.S. Bureau of the Census.

³Business Tax Program, City of San Diego.

⁴Second Thursday of month, Bloomberg News, San Diego Daily Transcript.

seen last year. As shown in the chart above, the numbers appear to be slightly improving, but have a long way to rebound to the levels seen during the prior decade. The stock index of publically-traded companies in

San Diego slumped during August from recent monthly highs. The local index reflects the turmoil of the national markets, which have seen some broad indexes off 20 percent from their yearly highs.

pressed both in dollar terms as well as increase in employment associated with the change of economic activity. For more on IMPLAN see

www.implan.com.

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³The leading businesses in each sector cited are from *San Diego Business Journal's* “2011 Book of Lists.”

⁴Ross C. DeVol, Kevin Klowden, Armen Bedroussian, and Benjamin Yeo, “North America's High Tech Economy”, Milken Institute, 2009, p. 9.



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