

HIGH-TECH

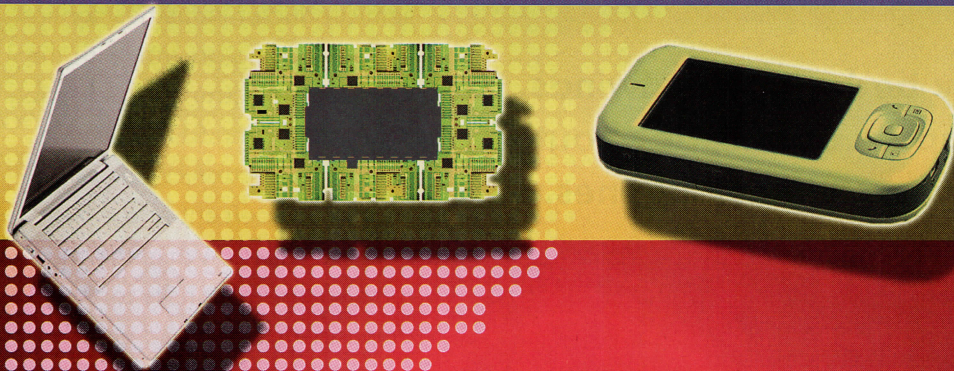


By Cynthia Kincaid

New technologies, the demand for quality workers, business-friendly cities, and access to more power are driving high-tech industries toward traditional tech hubs, and to some growing locations that are taking advantage of **the boom.**

Here in the United States, high-tech industries, once firmly set in a few places like California's Silicon Valley, are now finding homes in states across the nation. According to the Milken Institute's 2008 State Technology and Science Index, Massachusetts leads as the state in the best position to achieve high-quality economic growth because of its vast array of technology and science assets. The index also named Maryland, Colorado, and California as additional top locations for high-tech of the future. "States that have a vision and a plan for building and retaining

Hotspots: A ROADMAP



high-wage jobs and viable industries are finding ways to invest in their science and technology assets," says Ross DeVol, Milken's director of regional economics.

To be sure, other regions are emerging with their own specialties when it comes to high-technology pursuits. The Midwest is developing a leading edge in biofuels and wind energy; the East, Northeast, and Southeast for high-tech healthcare and biotechnology; and the West for solar and wind energy. "Sacramento is unique because it has a tradition of having clean technology and energy efficiency technol-

ogy, with a research anchor at the University of California–Davis," says Bob Burris, deputy director at the Sacramento Area Commerce & Trade Organization (SACTO). "Sacramento has always had somewhat of a cost advantage over some of the other areas in California, so we're seeing a lot of companies bringing their manufacturing out here."

Demand for Educated Employees

Access to qualified labor pools is a growing concern to many high-tech businesses;

those companies looking to locate or relocate to a particular area need to know they can depend on their selected region to supply its own labor.

According to the AeA's *Cyberstates 2008: A Complete State-by-State Overview of the High-Technology Industry*, Texas remains the second-largest cyberstate by tech employment, behind

president of White Mountain Labs. "This is a boon to the Grand Canyon State because tech industry jobs pay wages that are 88 percent higher than the state's average private-sector wage."

California's high-tech industries also added 21,400 jobs, a 2 percent increase, for a total of 940,700 in 2006. "The people and leaders of California — and Silicon

per 1,000 private-sector workers. Overall, Cyberstates reported U.S. high-tech employment totaling 5.9 million in 2007, up by 91,400, or by 1.6 percent. This is down from the 139,000 jobs added in 2006 and the 87,400 jobs added in 2005.

Electronics, Semiconductors, and Nanotechnology

The consumer electronics and semiconductor industries continued their rising growth, with the Consumer Electronics Association (CEA) predicting \$173 billion in consumer electronics sales in 2008, a 7.3 percent boost over 2007 revenues. "While there remain significant risks to the downside in the broad economy, we are beginning to see subtle, positive shifts in consumer sentiment," says Shawn DuBravac, CEA's economist. "Consumer electronics remain a vital part of people's everyday life, and an increasing appetite for technology is especially encouraging as we head into the fourth quarter and the holiday shopping season."

The semiconductor industry is also up almost 6 percent over last year, thanks to continued demand for computers and cell phones. "The back-to-school period is crucial for many CE manufacturers and retailers, so it is an encouraging sign that consumer sentiment remained strong in August," says Claudia Haase, director of research at CNET. "The overall economy may be facing headwinds, but consumers appear optimistic about the laptops, MP3 players, and cell phones that have

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California and ahead of New York. High-tech industries in Texas paid out \$37.5 billion in payroll in 2006, the most recent year for which statistics are available. The Texas average tech industry wage in 2006 was \$81,600. "With another solid year of growth under its belt, Texas' tech industry continues to be on the upswing — much like the technology industry as a whole," says Douglas J. Bartek, chairperson of the AeA Texas Council.

The report also says that Arizona remains a critical location for the semiconductor industry with 23,900 jobs in 2006, making it the fourth-ranked state nationwide in the industry. "Arizona's high-tech industry has now seen three straight years of job growth," says Brenda McCaffrey,

Valley in particular — continue to find new ways to innovate and new industries to develop," says Deirdre Hanford, chairperson of the board for AeA and a senior vice president at Synopsys, Inc. "However, maintaining the Valley as the preeminent high-tech hub in the state, the country, and the world will depend on a number of variables. These include maximizing the skills of a diverse work force, improving the quality of our education system, and investing in research and new technologies, such as green technology."

Other states that AeA says lead in high-tech employment include New York, Florida, and Virginia. In fact, for the second straight year, Virginia led the nation in concentration of high-tech workers in 2006, with 91 high-tech workers

become indispensable for today's students."

With increased consumer demand and concerns about qualified employment in these industries reaching a critical stage, a number of universities are working together and with private partners to update curricula and mentor students interested in high-tech careers. In Nebraska, for example, the Peter Kiewit Institute brings together students at two University of Nebraska campuses in a special high-tech academic program that combines computer science and engineering studies.

Data Centers

While data centers continue to be built all across the country, they are not without their challenges, namely operating costs and power demand. According to a survey conducted by AFCOM, the leading association for data center professionals, more than half of all data centers will have to relocate to new facilities or outsource applications by 2010. The key factor for this is the cost of cooling and power. Respondents to the survey also reported that insufficient power and excessive heat were two of the biggest problems facing data center operations, with 80 percent of AFCOM members acknowledging a power failure at their center within the last five years, most caused by power outages.

"Some of these large data centers have huge energy demands and tend toward locations with least-cost electricity, like areas with hydroelectric-generated electricity or nuclear-generated elec-

tricity," says Buzz Canup, managing principal for Fluor Global Location Strategies.

The Boyd Company, a site selection firm located in Princeton, New Jersey, compares the cost of operating data centers in 45 U.S. cities in its 2008 report *Banking and Financial Services: A Comparative Cost*

Analysis for Information Assurance Operations. Their conclusion: The most expensive city in which to run a data center is in New York City, where operating a 125,000-square-foot center runs \$28.1 million. The least expensive city is Sioux Falls, South Dakota, where the cost to operate a 125,000 square-foot center runs

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\$11.2 million. Perhaps this is the reason that ADP, HSBC, and Wells Fargo all have data centers located in Sioux Falls.

Biotechnology and Life Sciences

According to BIO, the world's largest biotechnology organization, biotechnology has created more than 200 new therapies and vaccines over the past few years, including products to treat breast cancer, diabetes, HIV/AIDS, and autoimmune disorders. There are more than 400 biotech drug products and vaccines currently in clinical trials.

As of 2006, there were 1,452 biotechnology companies in the United States, of which 336 were publicly held. The market capitalization of these publicly traded companies was \$360 billion as of April 2008. So great is the field that healthcare biotech revenues alone rose from \$8 billion in 1992 to \$58.8 billion in 2006. U.S. publicly traded biotech companies spent \$27.1 billion on research and development in 2006 and employed 180,000 people, according to BIO.

The top 10 states for biotech in the United States, according to the Battelle/BIO study *Growing the Nation's Biotech Sector*, are New York, New Jersey, North Carolina, Pennsylvania, Illinois, Indiana, Florida, California, Massachusetts, and Missouri. Also emerging as biotech hotspots are Georgia, Maryland, and Texas.

Green Technologies

On December 19, 2007, President George W. Bush signed

into law the Energy Independence and Security Act (EISA) of 2007. The key factor in this legislation was an expansion of the Renewable Fuels Standard (RFS), first enacted into law as part of the Energy Policy Act of 2005.

This expansion requires the use of 36 billion gallons of renewable fuels annually by 2022, of which 21 billion gallons must come from advanced biofuels; additionally, 16 billion gallons must come from cellulosic ethanol by 2022.

All of this is great news for those companies involved in the production of ethanol, solar, wind, and other alternative energy sources. "A lot of alternative energy sources are in the early stages of development," says Canup.

"It's not a huge market right now, but it's certainly going to develop into a huge market pretty quickly." The numbers certainly bear this out. According to Ethanol Across America, a nonprofit, non-partisan education campaign of the Clean Fuels Foundation, by late 2007, 125 U.S. plants had produced seven billion gallons of ethanol annually, with another 80 plants under construction. This has led more than 100 communities in the United States to build ethanol plants.

According to the U.S. Department of Commerce, as of 2005, the ethanol industry has added more than \$25 billion to the nation's gross economic output, through operating spending and capital spending for new plants; it has supported more than 147,000 jobs across all sectors of the economy; and \$4.4 billion went directly to consumers this

past year through increased economic activity and new jobs. In fact, the General Accounting Office reports that a 50 percent decline in ethanol production would cost the U.S. Treasury \$3.2 billion annually.

Solar power has also exploded in Europe, Japan, and the United States. According to the Global Solar Center, for the past 15 years, market demand for solar power has grown 30 percent per year. The U.S. solar market increased 57 percent in 2007 and is expected to skyrocket in 2008. The United States is the fourth-largest market for solar power behind Germany, Spain, and Japan, with California controlling 80 percent of the U.S. solar market.

The photovoltaic industry generated \$17.2 billion in global revenues in 2007. A report by the European Photovoltaic Industry Association and Greenpeace reports that solar energy could generate 2.5 percent of the world's electricity and fulfill the annual output from 150 coal-fired power plants by 2025. The report also stated that photovoltaic systems, which convert solar light energy into power, now generate 0.05 percent of world electricity and could rise to 2.5 percent in 2025 and 16 percent in 2040.

As high-tech industries continue to grow throughout the United States, more locations will have opportunities to join the growing list of hotspots. Those that can meet the needs of companies seeking low costs, educated employees, and highly desirable quality-of-life offerings will see the most success. ■■■