


[Hemlock Stays Home With \\$1-Billion Project](#)

# How the East Won 'The Next Big Thing'

**It's no accident that the world's largest microchip plants are being built in Asia. Booming markets also produce talent.**

by **RON STARNER,**  
[ron.starner@conway.com](mailto:ron.starner@conway.com)

**T**he world and the microchips that power it may be getting smaller, but corporate site selectors in the semiconductor industry are taking longer trips than ever.

That's what happens when a company based in California decides to locate a major chip R&D center in China.

**Applied Materials**, the world's largest semiconductor-producing equipment supplier, announced March 22 that it would expand its reach into China's electronics sector by opening a 106,000-sq.-ft. (9,848-sq.-m.) R&D complex on 25 acres (10 hectares) in the city of Xi'an.

That means a lot of frequent-flyer miles for site selection teams in the semiconductor and electronics industry, but it also means something else. The urbanization of China, India and other parts of the East is bringing with it a new wave of talent that won't just build semiconductors in the future; it will design them.

According to the Conway New Plant Database, 22 of the 25 largest facility investments in semiconductor plants since January 1, 2006, have occurred in Asia, including nine of the top 10.

The largest project announced this year is from **Hynix Semiconductor Inc.** in Cheongju, South Korea, a US\$5.33-billion manufacturing plant that will employ 2,000 people. The second largest is from **United Microelectronics Corp.** in Tainan, Taiwan, a \$5-billion investment. Intel announced a \$2.5-billion fab in Dalian City, China, while **Hindustan Semiconductor Manufacturing Corp.** announced a \$4.5-billion plant using **Infineon** technology in India.

In the past two months, two more massive chip plants landed in Asia. **ProMOS Technologies Inc.**, Taiwan's leading memory chipmaker, announced May 29 that it will build a \$2.5-billion wafer plant on the island. **Texas Instruments** announced May 3 it will invest \$1 billion in a new testing and assembly facility in the Philippines.

At Applied Materials, senior executives say they have found the right mix of cost efficiency, labor productivity and knowledge capital in China to help the company reach its expansion goals.

"The Xi'an center is a major expansion of our capabilities and positions us strategically to benefit as growth continues throughout China, particularly in the west," said Mike Splinter, president and CEO of Texas-based Applied Materials. "We are attracting quality employees from local technical universities, and this development and support center will be a cornerstone of our growth strategy throughout China and, indeed, all of Asia."



Most of Applied Materials' manufacturing capacity is located in Austin, Texas (above), but the company recently has been making significant facility investments in China. Access to growing markets and highly skilled engineers are two reasons why, say company executives.

Applied Materials established itself 22 years ago as the first semiconductor equipment firm in China. Since then, it has opened offices in Beijing, Kunshan, Shanghai, Suzhou, Tianjin, Wuxi and Xi'an and now employs 500 workers throughout the country.

The new operation in Xi'an will perform product development, system localization, engineering and software support for Applied Materials clients throughout the Asia-Pacific region.

Wang Ningguo, president of Applied Materials Asia, said the firm selected Xi'an for its educational and technical resources. The center is being located in the Hi-Tech Industries Development Zone in Xi'an, the capital city of 6 million people in northwest China's Shaanxi province.

Headquartered in Santa Clara in California's Silicon Valley, Applied Materials is a \$9-billion Fortune 500 company that was founded in 1967. Today, the firm is a global leader in nano-manufacturing technology with a broad portfolio of equipment, service and software products used in the fabrication of semiconductor chips, flat panels, solar photovoltaic cells, flexible electronics and energy-efficient glass.

The company's primary manufacturing site is in Austin, Texas, but it also operates divisions, including manufacturing, in England, Israel, Japan, Korea, Taiwan and Singapore. Globally, the firm employs 14,000 people. About 5,000 work in either Santa Clara or Sunnyvale, Calif. Another 2,500 work in Austin.

## 'Next Big Thing' Found in Xi'an

Josh Davidson, senior director of global real estate for Applied Materials, tells *Site Selection* that his firm selected Xi'an because "it offers a competitive cost basis to the east coast of China. Labor wages and utility rates have escalated in the east, and Xi'an has access to many major Asian hubs."

Steve Taylor, senior manager of corporate affairs for Applied Materials, says, "It is always popular to go someplace familiar in China, but we were looking for the next big thing because of the number of universities in Xi'an. We knew that if we got there early, we could get some great talent there. The availability of talent is why we went to Xi'an."

Logistics also played an important role. "Our customers are basically chip makers, and the Xi'an location puts us in a good position to serve them. It is centrally located in China," says Taylor. "Historically, we have expanded into being a global company by locating where our new customers are coming along before our competitors get there."

**"We have foreign students who get master's and doctor's degrees**

**here, and then we have to send them back to their home countries.**

**That doesn't make any sense."**

— Steve Taylor, senior manager of corporate affairs, Applied Materials

Davidson adds that "the majority of our customers are in Asia. Having an R&D facility and assembly facility close to our customers will put us in a more competitive position."

When Applied Materials evaluates locations for a new research or assembly site, Davidson says, the "most important site criteria" include access to engineering talent, construction costs, utility rates and the overall cost of doing business.

The executives at Applied Materials say Austin "will continue to be a major facility for us," but they are concerned about the growing shortage of electronics engineers in the U.S.

"We have been working with the American Electronics Association on the issue of labor supply," says Taylor. "A lot of American kids are not getting into engineering. We are trying to expand the visa program. We have foreign students who get master's and doctor's degrees here and then we have to send them back to their home countries. That doesn't make any sense."

Bill Archey, president and CEO of the AeA, tells *Site Selection* that "the big problem facing this industry is not lack of innovation or lack of sound management. The big problem is the inability to attract the people with the right technological background. It is a double problem. They can't get enough American kids because they aren't taking math and science. And they can't get the international kids because they can't get the right visa – the H1B visa for high-skilled workers."

## U.S. Labor Shortage a 'Real Problem'

Archey said AeA is lobbying Congress to raise the quota on H1B visas from 65,000 foreign high-skilled workers per year to at least 130,000. "If there is enough demand, there ought to be a way to go over the cap and meet the demand," he said. "When you've had an increase in high-tech jobs for the last two years, like the U.S. has had since 2004, the issue of having enough skilled laborers is a real problem."

Taylor says that "any state that invests in education in this area will be a national and global leader."

Despite the migration of many high-tech jobs to the Far East, Archey says the U.S. is on the upswing. "Contrary to what the newspapers are reporting, not every high-tech job in the U.S. is being outsourced," he notes. "We added over 147,000 new high-tech jobs last year," and electronics manufacturing employment grew by 5,100 jobs.

Archey says the rebound began in 2005, when the U.S. added 87,000 high-tech jobs. "It took us four years to recover from the high-tech bubble bursting in 2000," he said. "There were a lot of layoffs from companies. But since then, we have had a big increase. Semiconductor manufacturing has had the biggest increase, especially in California and Oregon."

To continue that growth, Archey says, "it is the responsibility of the high-tech industry itself to explain the industry to kids and tell them how exciting these professions are. We have not done a good enough job in this area."

Another factor driving chip plants to the Far East is the shortage of approved sites in the U.S. According to Bob Goforth, a leading site consultant in the chip industry, "most of the new fabs in the U.S. have been at existing sites where environmental issues are easier to deal with and where shared services and facilities are available."

Goforth predicts that more fabs will come to the U.S., "but it is impossible to forecast how many."

For now, one thing is clear: Asia will continue to dominate this sector, as long as it keeps growing and keeps producing the high-skilled labor the chipmakers want.

## Hemlock Stays Home With \$1-Billion Project

**A**fter considering greenfield sites in Kentucky, Europe and Australia, **Hemlock Semiconductor Corp. (HSC)** decided that the best course of action was to stay at home and expand its operation in Saginaw County, Mich.

The year-long site search ended May 2 with HSC announcing it will invest up to \$1 billion over four years to expand its polycrystalline silicon plant in the town of Hemlock. The company looked at 20 other sites before making its final decision.

Armed with \$267 million in state and local incentives, the joint venture between Dow Corning and two Japanese companies will create 500 jobs and nearly double its production capacity. By 2010, HSC expects to annually produce 36,000 metric tons of polysilicon, the product that powers one-third of the world's electronic devices and is a key component in solar panels.

"Our customers in the solar and semiconductor industries have a critical need for more of our materials," said Rick Doornbos, president and CEO of HSC. "This is the largest expansion in the history of this industry and is indicative of our long-term commitment to meeting the needs of our customers."

Deal insiders tell *Site Selection* that three factors sealed the project for Michigan: speed to market, exceptional rates for electric power and water, and government support.

Driven by 35-percent annual growth worldwide in the solar industry, HSC needed to ramp up its production rapidly.

"It was important to get our finished product as fast as we can to our customers," Dow Corning spokesman Jarrod

Erpelding says. "Speed to market played a tremendous factor in having the ability to expand our current location. The state of Michigan and the local governments of Saginaw County and Thomas Township provided greater than \$250 million in incentives. That played a tremendous role. It made it very attractive for this expansion."

The third and perhaps deciding factor was the local utility package. About 18 months ago, HSC negotiated a compromise with the Michigan Public Service Commission to establish a special rate for industrial customers that use at least 70.2



Hemlock Semiconductor's ongoing \$500-million expansion, announced in late 2005, is shown here. Before it was even finished, the firm announced an additional \$1-billion expansion at this same site in the town of Hemlock in Saginaw County, Mich.

million kilowatt-hours per year. The PSC and Consumers Energy agreed to extend that lower rate for the life of the expansion.

"They will spend \$70 million this year on electrical energy alone," says JoAnn Crary, president of Saginaw Future Inc., the local economic development team that landed the project. "That is their biggest cost. Another important factor in Michigan is water, because of our access to freshwater from the Great Lakes and our ability to provide it. HSC will use about 2 million gallons of water a day. We understand their needs and are committed to meeting them for the long term."



HSC is the single largest electrical energy consumer in the state, according to Erpelding. "Energy costs remain a concern, but the special utility rate played a role."

Erpelding also cites the area's work force. HSC requires workers with technical skills. The average annual wage created by the expansion will be \$46,436, according to state records.

The Michigan Economic Development Corp., in a report outlining HSC's incentives, predicts that the expansion will create nearly \$700 million in personal income over 15 years and pay an estimated \$45.67 million in state taxes.

Most of the incentives will come from an inter-local agreement that allows the City of Saginaw to offer 100 percent abatement of the company's taxes on personal property over 30 years. "It is estimated that this incentive could be worth up to \$242 million over the life of the abatement," the MEDC report states.

The expansion is HSC's third in Hemlock in three years. Combined, the projects are expected to create 1,174 jobs and up to \$1.5 billion in capital investment by their completion in 2012.

And the expanding may not be done. Company officials say they are continuing to scan the globe for a potential greenfield site for another polysilicon plant.

Crary hopes to land that giant too. "We are trying to develop a super-site that will serve the solar industry," she says. "We would like to put together a site of about 1,000 acres (405 hectares) in the region. We have identified some locations, but the initiative has just begun."

Leading contenders for the super-site are various tracts near the towns of Midland and Freeland in the tri-county (Saginaw-Bay-Midland) area.

– Ron Starnier

[www.siteselection.com](http://www.siteselection.com)

[TOP OF PAGE](#)

---

[Top of Page](#) | [Letter to Editor](#) | [Site Selection Online](#) | [SiteNet](#)

Site Selection Online – The magazine of Corporate Real Estate Strategy and Area Economic Development.  
©2007 Conway Data, Inc. All rights reserved. SiteNet data is from many sources and not warranted to be accurate or current.