

Schools changing to meet chip plant's needs



Hudson Valley Community College students conduct research in high-tech laboratories at the college's TEC-SMART facility in Malta.

CAPITAL REGION – GlobalFoundries' \$4.6 billion computer chip manufacturing plant under construction in Malta is not only boosting the Capital Region's economy, it's also revamping curriculum at colleges and high schools.

The factory is expected to employ nearly 1,500 people once operational in late 2012.

One question is how this will impact local schools with a potential influx of new workers. Rocky Ferraro, executive director of the Capital District Regional Planning Commission, does not expect that GlobalFoundries will cause an immediate boost in enrollment, pointing out there are about 135,000 jobs in the Capital Region.

In addition, GlobalFoundries officials have said that about 75 percent of the positions would be filled from the existing Capital Region work force.

However, there is the potential for spinoff businesses as the Capital Region as a whole is being branded "Tech Valley." A report called *CyberCities 2010* from TechAmerica in Washington rated the region as one of the fastest growing areas for high-tech employment. The Wall Street Journal also recently profiled the area.

Ferraro cited the research being done at the University at Albany's College of Nanoscale Science and Engineering, the relocation of high-tech construction firm M+W Group to the Watervliet Arsenal and General Electric's alternative energy research. However, growth will be spread out so that not any one school district will experience a surge in enrollment.

"It's not going to result in an explosion of growth," he said. "There's a lot of national and international competition that there wasn't two decades ago. Everybody is trying to attract the same type of industry."

Preparing workers

Still, colleges and even high schools are preparing for the next generation of workers. Qualified graduates can go right into a job – even in a difficult economy.

Robert Geer, vice president for academic affairs at the University at Albany's College of Nanoscale Science and Engineering, said a recent Ph.D graduate was hired by GlobalFoundries and is currently training at a facility in Fishkill.

"I think this is an aggressive step considering they have not opened their fab [plant] yet. That shows the need they have for highly trained people," Geer said.

The college has four-year degree programs in nanoscale science and nanoscale engineering. It has already attracted several high-profile companies to the campus.

In January, the International Sematech computer chip research consortium will begin moving its remaining operations there from Texas. State officials touted the move as bringing more than 100 high-tech jobs. Other companies housed at the college include Tokyo Electron, IBM and Samsung.

CNSE has facilities very similar to what is used at companies like GlobalFoundries. Its latest initiative is a partnership that will allow qualified Siena College students studying biochemistry, biology, chemistry, physics, computer science or mathematics to take undergraduate lecture and laboratory courses at CNSE during their junior year. Those credits will count toward their graduation at Siena but also give students an edge for admission into CNSE's master's and doctorate programs.

These students will also have access to semester-long research projects and summer internships.

The college already has a summer internship program for high school students interested in pursuing careers in the nanotechnology industry. They get to team up with professors and graduate students on a topic that interests them.

RPI partnership

Rensselaer Polytechnic Institute is also linking up with GlobalFoundries. John Kolb, vice president for information services and chief information officer at RPI, said the chip manufacturer is running some of its advanced computer simulations through its Computational Center for Nanotechnology Innovation. Computer chip size is getting so small that sophisticated computer modeling is required before time and money is invested in building facilities. There is also a tremendous amount of intellectual resources involved in the project.

"This is essentially going to be the most advanced foundry in the world. I think sometimes that's lost on all of us in this region," he said. "The only way you're going to keep it at that level is making sure you have strong partnerships at places like ours."

However, not everybody needs to have a Ph.D to get a job in this field, Geer said. For every one person with a doctorate working at CNSE, there are 14 who don't. Typically, companies start hiring the top-level positions first and then ramp up with employees who have two-year degrees and four-year degrees.

That is where the local community colleges come into the picture. The college has partnered with Hudson Valley Community College, Schenectady County Community College and Fulton-Montgomery Community College.

HVCC has offered an associate's degree in semiconductor manufacturing since 2005 and in January opened its TEC-SMART training center in Malta, which has alternative energy labs and computer chip manufacturing labs. There are currently 700 students and 1,200 graduates of the program.

Carolyn Curtis, vice president for academic affairs for HVCC, said GlobalFoundries will have a huge impact. The college is all about finding partnerships to be responsive to the needs of local industry. "We churn out the work force," she said.

College officials discovered that they were not adequately preparing people for the "soft skills" that companies like GlobalFoundries require including people relationships, interviewing, math, physics and chemistry.

One of the things GlobalFoundries puts an emphasis on is finding disciplined and loyal employees who will work for the company for their entire career, according to Curtis.

Discipline is especially important since these technicians are working on equipment that costs millions of dollars. Any mistake could cost the company a lot of money.

Efforts at SCCC

Schenectady County Community College has also been ramping up its high-tech programs in response to local industry. The college has had a nanoscale materials associate's degree program since 2006 as part of a partnership with Union College and SuperPower, a Schenectady-based business that develops superconducting electric power components.

This past year, it added a two-year associate's degree program in alternative energy and a one-year certificate program in storage battery technology in response to General Electric's proposal to build a \$100 million battery manufacturing plant.

At a recent fair, local employers made students aware of the types of high-tech jobs available, according to SCCC President Quintin B. Bullock.

"We have had increased enrollment in the program," he said.

SCCC has 43 full-time students and 12 part-time students in the two-year nanoscale materials program. The college has also launched an associate's degree program in alternative energy and hired Li Wu as its first full-time instructor for its alternative energy technology and storage battery technology programs.

It is also working on a program to allow students to transfer their two-year nanotechnology degree into a four-year program so they can continue their studies.

In addition, Bullock sees a boon for other subjects at SCCC because GlobalFoundries will attract a lot of people with expertise in information and radiologic technology, which are skills also needed in the health care field.

"There will be a need for the community colleges to train new employees to backfill for other employers that lose employees to the larger industry," he said.

In addition, GlobalFoundries and other tech companies will likely stimulate demand for hotels and restaurants, which will create jobs for graduates of SCCC's hotel and tourism and culinary arts programs.

Starting in high school

Younger students are getting a jump on their studies. Through a partnership with HVCC, Ballston Spa High School students will have the opportunity to take college-level courses in the high school, as well as work in the laboratories at the TEC-SMART facility.

"It's putting them right in the environment that they need to be in so they learn first about the jobs these technicians are going to go into," Curtis said.

It is not realistic for every student to wind up working at GlobalFoundries. However, the skills that they learn can prepare them for a vast array of careers, said Tech Valley High School Principal Dan Liebert.

These skills can transfer to other fields such as bioscience, computer technology and alternative energy. "All of these things require new ideas, new approaches, interdisciplinary thinking," he said.

New York state has done a fairly good job of teaching students content, Liebert said, but it has not traditionally done a good job teaching students critical thinking and working in teams.

“When they don’t know something, we’re not necessarily good at showing kids how to find information and evaluate it,” he said.

The 125 students at Tech Valley High participate in project-based learning and learn to collaborate with each other.

Focus on stem

Aside from Tech Valley High, general high schools are going to be changing their curriculum to focus more on the so-called STEM subjects (science, technology, engineering and math), according to New York State School Boards Association spokesman Brian Butry.

“I think you’re going to see more and more schools in the area adding courses and curriculum and things we would have never dreamed of when we were kids,” he said.

Among some of the challenges are finding qualified people to teach these classes who could certainly make more money being scientists or engineers, Butry said.

“We need to make sure we can recruit the best and brightest to teach our kids to make sure we can educate tomorrow’s work force locally rather than finding out that a lot of these jobs are being filled by kids from other states or kids from other countries,” he said.

The key to creating a future pipeline of students and workers is to stimulate interest in nanotechnology at a young age, Geer said. Teenagers are familiar with iPhones, laptop computers and video game players.

“Too often there’s a disconnect between that and the science that makes that possible. When you make that connection, all of a sudden, the students are much more keyed in,” he said.