

## Nanotech energizing petrochemical future

### Consortium works to reduce emissions

By Laura Severs

*Business Edge*

An Edmonton-based firm is using advanced nanotechnology to improve the way petrochemicals are produced. Quantiam Technologies Inc., along with its public and private business partners, wants to modify the way olefins – the single largest group of industrial petrochemicals worldwide - are fabricated.

They're hoping to make inroads that will significantly improve the economics and environmental impact of the \$80-billion-a-year global olefin industry. "Quantiam and our consortium partners are committed to the successful development and demonstration of this new nanomaterials technology to the benefit of Canada, our environment and all of our stakeholders," Steve Petrone, Quantiam president, said last week. Petrone believes the company's technology can lower a producer's energy costs and reduce the amount of greenhouse gases created in the manufacturing of olefins.

Used to make common products such as plastics, lubricants and antifreeze, olefins are manufactured through conventional hydrocarbon steam cracking, a costly and energy-intensive process. Energy costs associated with the traditional production of olefins exceed \$10 billion a year, not to mention the significant CO<sub>2</sub> emissions that are a byproduct of the fabrication procedure.

Petrone said Quantiam intends to reduce the amount of heat or energy needed by about 20 per cent, a figure he calls conservative.

To achieve its objectives, Quantiam and its partners, which include Nova Chemicals Corp. and Sustainable Development Technology Canada (SDTC), a not-for-profit foundation created by the Canadian government to advance clean technologies, have developed a powder that will coat the furnace coils used in steam cracking.

The consortium's technology will allow for manufacturing at lower temperatures. In turn, they say, this will also result in lower emissions.

Nova's Anita Arduini said her company will be testing the Quantiam technology at its Joffre plant, just outside Red Deer, and in its Corunna, Ont., facility near Sarnia.

Arduini, technology business development manager for Nova, said she is hopeful the new process will allow the company to cut down on the large amount of natural gas it needs to fire up its plants. She added even a slight reduction in the temperature during the manufacturing process would be beneficial.

Quantiam officials say the company uses the most advanced analytical tools in Canada's private sector for characterizing nanomaterials. It also develops energy-related catalysts and nanomaterials for reducing greenhouse gas emissions.

Petrone said it is by combining new methods and pushing conventional wisdom past its limits that they've been able to get this far with its so-called "disruptive" technology.

"By disruptive technology, I mean it brings a paradigm shift to the application," Petrone said. "You take the conventional wisdom of how something is supposed to be made and look beyond that. It changes the way something is assumed to be possible."

The project, which started in 2001, is expected to be officially launched in 2007. At that point, Petrone said, there is a five-year plan to capture 30 to 35 per cent of the global market, including the entire Canadian share. Currently, pre-commercialization is scheduled for 2005 and 2006.

Quantiam employs 14 people, including five with PhDs. Once the project gets off the ground in 2007, Petrone said, staffing levels will rise to between 60 and 70, eventually growing to a total of 120 to 140 employees.

The growth means Quantiam will likely need to expand. "We've run out of space here," said Petrone. "We will be looking to make a decision, when we launch, on a 40,000- to 50,000-sq.-ft. facility."

The \$9.8-million undertaking by Quantiam and its partners includes new SDTC funding of \$1.45 million, announced last week at a press conference at Quantiam's southeast Edmonton office.

"SDTC funding is helping our consortium bring this technology to market faster by addressing the most critical, under-funded links in the innovation chain – the piloting and demonstration stages," said Petrone, who noted that funding such a project would likely be easier outside Canada.

"Clearly, funding and financing is always an issue. It's a lot easier to raise funds for such activities south of the border and elsewhere," said Petrone.

But Edmonton's emerging strength in nanotechnology is a key reason why Quantiam is in the city, he added. "We really like it here. Our scientists like it here, our families are Edmontonians. But if the National Institute for Nanotechnology (NINT) was not here (at the University of Alberta), the pull for this area would not be as strong," said Petrone.

Jim Rudolph, spokesman for Edmonton Economic Development Corp., said the Quantiam Technologies announcement adds to the momentum of Edmonton's burgeoning nanotechnology cluster.

Along with NINT and a growing number of local companies working in the nanotech sector, "it does display the kind of talent and innovation that is taking place in Edmonton," he said.

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