BUSINESS

Nanotech's big issue

Lack of regulation and risk assessment could hamper the nanotechnology sector. **Virginia Gewin** reports.

Nanotechnology is at last set to start delivering on its promise as a growing number of products hit the market place. But even as companies put the finishing touches to their ideas, there is growing unease that the sector is ill-prepared for the rigours of the public arena.

New technologies carry with them an attendant risk, and nanotechnology is no exception. At the start of this year, 'nano' was an advertising buzz word (see *Nature* **440,** 262; 2006) — now, that gloss is already beginning to fade.

BASF has opted to publicize its nanotech research on the web.

BASF

In March, a number of German consumers experienced respiratory problems after using the glass sealant Magic Nano, and the product was pulled from the shelves. Although later tests showed that, despite its name, the product contained no nanoparticles, the incident heightened public awareness that nano-related products might carry unforeseen risks.

Mindful of the lessons learned over the marketing of genetically modified food, the nanotech sector is taking steps to address the risks, real or perceived, associated with its products. Some consumer advocates, for example, have questioned whether nano-sized particles might behave differently in the body from larger particles if ingested or inhaled. And many companies are taking such concerns seriously.

German chemical giant BASF, for example, is developing a number of nanotech applications and publishes extensive information on its website about its activities. And chemical firm DuPont has joined forces with the non-profit group Environmental Defense in New York to develop a framework for companies to assess nanotech risk.

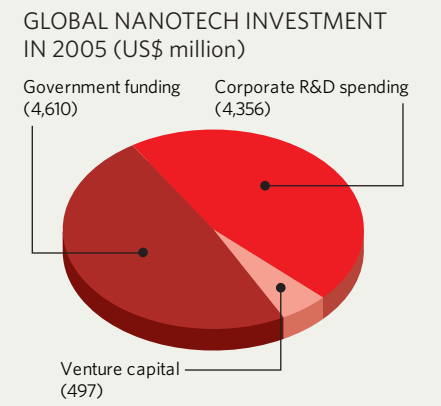
These companies have had to act on their own initiative because there are no regulations anywhere in the world to govern nanotech-related products. This lack of regulation worries observers and investors alike.

"Nobody wants to see over-regulation, but everyone is aware that the biggest risk for nanotechnology is no regulation," says Christoph Meili, chief executive of the Innovation Society, a nanotechnology consulting group based in Switzerland. The greatest concern focuses on nano-sized particles used in consumer products, such as cosmetics or mineral supplements, that fall outside the existing purview of agencies such as the Environmental Protection Agency (EPA) or the Food and Drug Administration (FDA).

There are some moves to address this situation. The EPA and the UK Department for Environment, Food and Rural Affairs are exploring schemes whereby companies would voluntarily report risk findings. The FDA recently assembled a task force to determine regulatory approaches to safeguard products using nanotechnology. And last summer the European Commission released a nanotech action plan to serve as a framework for crafting future regulation.

So far, health and safety issues have not hampered overall investment in nanotechnology companies, according to a report this May from analysis firm Lux Research based in New York. Although the number of nanotech-related deals declined slightly in 2005, total venture-capital investment increased from around $410 million to almost $500 million (see graph).

A follow-up report from Lux, published in June, highlighted the increasing worries about product safety. It quoted anonymous nanotech-savvy executives saying that some companies had halted their nanotech plans over confusion on how to judge potential hazards. For example, one interviewee said his firm had stopped developing a product when it became clear that it would cost too much to ensure the product would be risk-free for its entire life.



SOURCE: LUX RESEARCH

Such concerns can dissuade investors. Steve Jurvetson, managing director of Draper Fisher Jurvetson, a venture-capital firm in Menlo Park, California, says his group simply doesn't invest in areas with an unspecified regulatory regime because it's not worth the risk. Like many investors tempted by the sector, he sticks to supporting nano-sized improvements to existing products rather than novel nanoparticles that, as yet, have little direct application.

Perceived risk is a formidable issue that must be addressed, says Michael Holman, an analyst at Lux. The Magic Nano incident raised the business community's awareness that the public needs to be better educated about nanotech's benefits and risks. Some note that the word 'nano' is no longer a hot marketing term. "It's not helpful any more to use nano for your company name," says Juan Sanchez, a vice-president at Punk, Ziegel and Company, an investment bank in New York.

More risk research could only help. In 2005, according to its own estimate, the US government spent some $40 million on research into the risks of nanotechnology. But an independent review of research documents found only $11 million that had clearly been spent on those areas, says David Rejeski, director of the Woodrow Wilson International Center for Scholars' Project on Emerging Nanotechnologies in Washington DC. His group has called for a minimum investment of $100 million over the next two years; Dupont and Environmental Defense have called for the same amount to be spent annually.

As nanoproducts develop beyond films and coatings to more novel nanostructures, analysts suggest that more risk research is in the industry's best interest. The EPA approved its first nanoproduct, the manufacture of a specific carbon nanotube, last autumn under a clause of the Toxic Substances Control Act. Any future products will have to be subject to this act and myriad current regulations from different agencies — as well as any likely future nano-specific amendments.

But with the number of products ready for market set to increase, many argue that the sector must act quickly. "My fear is that once we figure out how to do first-generation oversight," says Rejeski, "the second generation will be here." ■