

Contact:

Peter Hebert
Lux Research, Inc.
646-723-0702
peter.hebert@luxresearchinc.com

NANOTECHNOLOGY'S ENVIRONMENTAL, HEALTH, AND SAFETY RISKS CAN BE ADDRESSED RESPONSIBLY TODAY

Lux Research report finds that more nano-enabled products are exposed to perceived risks than real ones

New York, NY – June 15, 2005 – Stakeholders ranging from corporations to start-ups to protest groups are concerned about the environmental, health, and safety (EHS) risks of nanoparticles – the prospect that tiny, engineered particles of matter might harm workers, consumers or the environment. While such EHS risks do exist, they can be appropriately addressed today using well-established risk management techniques, according to a new report from Lux Research entitled “A Prudent Approach to Nanotech Environmental, Health, and Safety Risks.”

“If definitive data was available about the toxicity and environmental impact of nanoparticles, there would be no debate,” said Lux Research Vice President of Research Matthew M. Nordan. “However, today fundamental research in the field is just getting underway. Lab-based studies are thin on the ground, and those that have been published sometimes conflict. We recommend that corporations and start-ups assess nanotech EHS issues based on existing risk management frameworks – substituting informed, conservative proxies for definitive data – to make wise commercialization decisions.”

To build a framework for assessing nanotech EHS risks, Lux Research conducted exhaustive secondary research on the issue and interviewed 42 relevant start-up executives, academics, government agency representatives, non-governmental organization representatives, insurance company executives, and corporate EHS officers. The report finds that:

- Nanotech EHS risks fall into two distinct classes: 1) *real* risks that specific types of nanoparticles may be hazardous, and 2) *perceived* risks that they pose a threat regardless of whether or not it is real. Both are equally important in gating the progress of nanotechnology commercialization.
- Many nanotechnology applications, such as nanoimprint lithography and insulation made from nanoporous materials, do not incorporate nanoparticles and thus present little cause for concern.
- Different types of nanoparticles merit different levels of caution. Some, like silicon nanowires, look to be harmless on current evidence; others, such as cadmium-selenide quantum dots, raise greater cause for alarm.
- Even the most dangerous particles pose no threat if people never encounter them in significant quantities. The potential for exposure to nanoparticles varies across a product's life cycle. Workers have the potential to be exposed to large quantities of nanoparticles at manufacturing, but in factory environments that can be tightly controlled; consumers are unlikely ever to be exposed to engineered nanoparticles that might enter their bodies because nearly all applications will fix nanoparticles in place, for example inside a plastic composite; and the environment may be exposed to nanoparticles when the products they're incorporated in are discarded at end-of-life – the life cycle stage with the greatest uncertainty and need for more research.
- Of \$8 trillion in projected manufacturing output incorporating nanotechnology through 2014, Lux Research calculates that 25% is exposed to real risk at manufacturing, which should be easiest to mitigate. 7% is exposed to real risk at use, and 14% is exposed to risk at end-of-life. However, 40% is exposed to perceptual risk.

The report finds that nanotech EHS risks require specific actions from corporations, start-ups, investors, and governments to address. Corporations and start-ups should consider the full lifecycle of nanoparticles in the products they go into, focus on communicating nanotech's benefits to consumers as well as risks, and work together to execute fundamental toxicity studies early in application development. Investors should incorporate EHS risks into their valuations of nanotech start-ups and publicly traded companies, affording them the same priority as the strength of the company's management team or intellectual property.

“Ultimately, governments are accountable for ensuring that applications of nanoparticles are developed responsibly,” said Nordan. “We believe that funding levels for nanotech EHS research must be substantially increased to between two and four times today’s spending; only 3.7% of the \$1.05 billion U.S. National Nanotechnology Initiative budget for 2006 is earmarked for EHS issues. Further, governments must wield their influence to coordinate today’s globally splintered nanotech EHS initiatives, and set clear expectations for industry as to how they plan to regulate nanoparticles. There is evidence that regulatory ambiguity is beginning to slow commercialization.”

The report provides decision tools that assess the likely EHS risks of ten categories of nanomaterials across ten target applications. The full report is available immediately to clients of Lux Research’s Nanotechnology Strategies advisory service. For information on how to become a client, contact Rob Burns, Vice President of Sales, at (646) 723-0708. An executive summary of the report is available at www.luxresearchinc.com

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