



Lawmakers look to tiny technology to create big business

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The emerging field of nanotechnology holds such promise for advances in materials science and medicine that many consider it the next technology revolution. Yet, much of the general population knows little about the science or its multitude of possible uses.

“Nanoparticles,” which by definition are on a scale of a billionth of a meter and are thousands of times narrower than the width of a human hair, have unique practical uses in commercial, medical and military applications.

When engineered at the “nanoscale,” conventional materials exhibit special properties largely because the small particles have a relatively high surface area compared to volume, which makes the substance highly chemically reactive. For example, at the nanoscale, carbon can conduct

electricity, gold can destroy bacteria, and silver can kill microbes even more efficiently than usual.



Rep. Terese Berceau

As part of an effort to provide broader education about nanotechnology and the application of nanomaterials, the University of Wisconsin’s Mate-

rials Research Science and Engineering Center on Nanostructured Interfaces has been hosting policy workshops on the subject. The second workshop in the series, which was held in November, was intended for state policymakers.

“It introduced us to a whole range of topics that we need to be thinking about, from understanding what nanotechnology is and how much of it is already out there in the marketplace to what the issues will be for government in terms of possible regulations,” says Wisconsin Rep. Terese Berceau, one of about 30 attendees who participated in the three-day workshop in Madison.

Sessions covered a wide range of issues: basic education on nanotechnology and its applications; concerns over potential environmental and health impacts of exposure to nanotechnology particles; the quality-of-life and economic benefits to be gained from the application of nanotechnology in manufacturing as well as health and environmental science; and the creation of a workforce, from technicians to Ph.D. students, educated in the field.

In addition to the more scientific uses for nanotechnology, such as drug delivery and medical devices, manufacturers of consumer goods — including cosmetics, skin creams, sunscreen, baseball bats, car wax, paint, and stain- and odor-resistant clothing — are using nanotechnology to improve the performance of their products.

Berceau was surprised to learn how many consumer products already contain nanomaterials.

“We think nanotechnology is something new,” the Democrat from Madison says. “It’s not new in quite the same way I thought it was.

“It’s out there. It’s in the marketplace. I didn’t understand the [frequency with] which it is used and the number and diversity of products that it can be and already is used for.”

Having to think small

While the presence of nanotechnology in our everyday lives may be surprising to some, it highlights one of the concerns about the technology: the potential for unintended health and environmental impacts as these tiny particles are released into the environment, absorbed through the skin or inhaled.

To date, little regulation exists, and companies are not required to report the use of nanomaterials in the manufacturing process. Furthermore, depending on their use and classification as a chemical or a drug, regulation of the materials would fall under different agencies.

In late November, the U.S. Environmental Protection Agency announced that it will issue the first federal restrictions directed at nanotechnology. It will release regulations pertaining to consumer products containing nanoscale silver — a material used as an odor-destroying substance in products such as clothing, food-storage containers and air fresheners — in order to safeguard against unanticipated environmental risks.

At the Madison conference, a director from the EPA highlighted the different uses of nanotechnology and the debate over regulation. He also assured attendees that the EPA is “ahead of the curve, or at least riding the wave,” in terms of evaluating the risks associated with nanotechnology exposure.

Despite his reassurance, the number of unknowns related to nanomaterials has some concerned.

“I have all sorts of reasons to be interested in this issue, as a scientific issue as well as a state issue,” says Wisconsin Rep. Charles Benedict, a retired neurologist.

He compares the controversy to the concerns raised years ago over asbestos, which turned out to lead to serious health and environmental issues. Some fear the yet-unknown, long-term impacts of the tiny particles used in nanotechnology.

“As a physician, I was interested in some of the warnings and caveats and some of the potential dangers,” the Democrat from Beloit says. “It’s not an area that we’ve had much experience with, and the technology to detect disease and to detect exposure is still in its infant stages.

“I think it’s a warning that we need to move slowly and try to do good science.”

Evaluating state’s role in industry

Benedict sees a role for state government in encouraging and financing research and development, as well as in studying some of the potential health and environmental risks.

The November workshop also ignited his desire to see state government renew its focus on technology issues in general.

“Science plays a bigger and bigger role in our day-to-day lives,” Benedict says.

In response, he’d like the Legislature to form a new policy committee on science and technology.

Lawmakers also can take an active role in the process by laying the groundwork for the industry, creating policies that promote research, development and oversight.

“One [needed improvement] is to make sure our education system is geared up to produce students who have the educational backgrounds to go into jobs in the field,” Berceau says.

She also would like to see a reporting requirement for companies using nanotechnology.

“We need to know in what way they are using it,” she says, “so that if at some point in the future we do know that there are some risks associated with it, we know where our problems might be and what companies might be contributing to the problem.”

Berceau adds that the issue reaches beyond the Wisconsin borders and the work being done by researchers and businesses in Madison.

One challenge will be competing with other regions, which typically see more investment in the areas of science and technology.

“It might be that what we need is a regional effort to promote the Midwest as a technology center in competition with the East and West coasts,” Berceau proposes. “Maybe it would behoove the Midwestern states to work together to change the notion that these things are only happening on the coasts.”

On the economic side, Berceau and Benedict hold hope for the potential benefit to be gained from the development of a larger nanotechnology industry.

“I foresee it as an important issue for the future, both in general and particularly for Wisconsin,” Benedict says.

Berceau says, “We’re talking about something that could be very, very big for our economy and for the people of Wisconsin.”



Rep. Charles Benedict