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SEMI and Nanotechnology

A Public Policy Perspective

Nanotechnology is the control and application of novel properties of materials that are the result of nano-scale dimension.

SEMI member companies supply the enabling technologies, including raw materials and advanced tools, to produce every semiconductor-based product. Revolutionary nanoelectronic materials, tools and equipment are likely to be used for selected semiconductor applications in the next three years. Global demand for nanoelectronic materials, tools and equipment are estimated to be $1.8 billion in 2005 and are forecasted to reach $4.2 billion in 2010, with revolutionary products representing ~20% of the total in 2010. The U.S. National Nanotechnology Initiative (NNI) defines nanotechnology as "research and technology development at the atomic, molecular or macromolecular levels, in the length scale of approximately 1–100 nanometer range, to provide a fundamental understanding of phenomena and materials at the nanoscale and to create and use structures, devices and systems that have novel properties and functions because of their small and, or intermediate size."

SEMI urges the U.S. Government to be the global leader in nanotechnology R&D.

Many countries recognize the importance of R&D funding for nanotechnology and the United States needs to remain competitive. An estimated $13 billion of manufactured goods incorporated nanotechnology in 2005. Also, during 2005, private companies invested about $5 billion in nanotech research and development. Government spending is holding steady at $4.7 billion annually, nearly equally divided among Asia, Europe, and North America. The President's Council of Advisors on Science and Technology (PCAST) has found that more investment is needed for nano R&D or the United States risks losing its leadership in this area. The National Nanotechnology Initiative (NNI) is doing a significant amount of work in nanotechnology, but much more needs to be done in order for the United States to lead in this innovative field in the future.

SEMI supports a reasoned approach when addressing nanotechnology related environmental, health and safety issues.

Nanotechnology is a broad term encompassing a wide variety of materials and processes, and the differences between types of materials, processes, and applications. suggests that one blanket approach to risk assessment will not be sufficient. The semiconductor equipment and materials industries have long been working in the nanometer scale. The overall risk assessment approach used by the Environmental Protection Agency (EPA) for conventional chemicals is expected to be generally applicable to nano materials. While SEMI believes that nanotechnology will enable a variety of benefits, it also realizes that benefits and risks must be understood and weighed. SEMI supports scientific-based research and the responsible development and application of nanotechnology. SEMI encourages its members to participate in global nanotechnology environment, health and safety (EHS) initiatives to help better understand the potential EHS implications of nanotechnology and educate our numerous stakeholder groups.

SEMI is concerned about possible new export controls on nanotechnology products and cautions against further controls until this technology is better defined.

Nanotechnology should not be controlled simply because it is nanotechnology. This label is often applied quite broadly. Strict criteria should apply as would be the case in considering controls in other areas. In fact, existing controls may cover some items that may be deemed sensitive. Controls should be imposed only if truly necessary and any new controls should be adopted only if there is genuine multilateral agreement with our partners in the Wassenaar Arrangement. SEMI urges that any new export control regulations in nanotechnology be carefully crafted, negotiated and implemented so that U.S. companies are not put at a competitive disadvantage that would threaten U.S. leadership in this field. Enacting tighter controls at such a preliminary phase could compel companies to consider locating outside the United States to avoid overly bureaucratic regulations. It would be counterproductive to adopt policies that may spur development and location outside the United States.

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