Advanced Materials to be Market Leader by Year 2000

By the year 2000, advanced materials are expected to constitute by far the largest market of 12 emerging technologies identified by the United States Department of Commerce's Technology Administration in its recently released report, "Emerging Technologies: A Survey of Technical and Economic Opportunities." Advanced materials are expected to command a market of $150 billion in the United States by the millennium, almost 43% of the total of $356 billion. They are expected to command a market of $400 billion worldwide, or 40% of the approximately $1 trillion anticipated.

Other technologies and their expected market share include: superconductors ($5 billion), advanced semiconductor devices ($75 billion), digital imaging technology ($4 billion), high-density data storage ($15 billion), high-performance computing ($50 billion), optoelectronics ($4 billion), artificial intelligence ($5 billion), flexible computer integrated manufacturing ($20 billion), sensor technology ($5 billion), biotechnology ($15 billion), medical devices and diagnostics ($8 billion).

The report also identifies four groupings of the 12 technologies, of which emerging materials (which included advanced materials and superconductors) leads the pack with an estimated year 2000 market of $155 billion. This is followed by emerging electronics and information systems (including advanced semiconductor devices, digital imaging technology, high-density data storage, high-performance computing and optoelectronics) with a combined market share of $148 billion; emerging manufacturing systems (including artificial intelligence, flexible computer-integrated manufacturing and sensor technology) commanding $30 billion; and emerging life-sciences applications (including biotechnology and medical devices and diagnostics) comprising $23 billion.

The United States is expected to "lose badly" to Japan both in R&D and new products in the 1990s in the emerging materials area if current trends continue, despite having been ahead in both areas through most of the 1980s. America is expected to stay about equal, and perhaps a little ahead, of the European community in both. As of 1989, the United States was seen as being even with Japan in superconductors and behind in advanced materials.

In order to remain competitive in the international economic community, U.S. industry must increase emphasis on research and development of new products and emerging technologies and on product commercialization and market share, the report says.

To reverse the current trend, new strategies must emerge from a continuing dialogue including members of labor, academia and government, according to the report. Actions are required to maximize the benefits that the United States can derive from opportunities offered by emerging technologies, the report intones. "If we succeed in stimulating improved competitiveness, then the outlook is good because this country remains strong in the generation of new science and technology options."

The study defines advanced materials as structural and functional ceramics, ceramic and metal matrix composites, intermetallic and lightweight alloys, advanced polymers, surface-modified materials, diamond thin films, membranes, and biomaterials. It defines superconductors as high temperature ceramic conductors and advanced low-temperature conductors.

The study defines emerging technology as "one in which research has progressed far enough to indicate a high probability of technical success for new products and applications that might have substantial markets within approximately 10 years."

MRS Office of Public Affairs
Washington, DC

https://doi.org/10.1557/S0883769400062382 Published online by Cambridge University Press