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Staying Competitive

D. Allan Bromley

Representative James Sensenbrenner (R–WI), chair of the House Science Committee, recently unveiled H.R. 2086, the Networking and Information Technology Research and Development Act. The Act authorizes the doubling of the federal investment in information technology over 5 years, and it makes permanent a research and development tax credit for industry. The bill has the potential to be an important piece of science policy. Unfortunately, it runs the risk of being no more than a political tool to garner campaign support from high-tech industrialists.

No doubt, the support of the high-tech community is a political prize. Presidential candidate George W. Bush made a 2-day visit to the leaders of Silicon Valley and netted a million dollars for his political campaign. Al Gore's recent visit reaped a third of a million. In the meantime, administrative initiatives and legislative proposals from both political parties abound that address the interests of high-tech industries. Representative Sensenbrenner's bill trumps these proposals.

"Industry invests in the present; the government invests in the future."

If the discussion about H.R. 2086 becomes merely political one-upsmanship, it will be a missed opportunity. Currently, congressional staff comments on the bill focus on software development and increasing access to information technology. That focus is far too narrow. The bill will only be a valuable piece of legislation if it works to maintain the nation's long-term competitiveness in information technology and addresses the key basic research issues that will bedevil the industry 10 years from now.

Consider an emerging basic research problem in the information technology industry. The industry's phenomenal growth has been fueled in large part by a public demand for miniaturization and increased processing speed. Although there is every indication that the demand will continue, the technology that is currently under development will be able to keep up with demand for less than a decade. As they say in the industry, "the end of silicon is in sight." With industry focused on immediate competitiveness, the proper role for the federal government is to ensure that an alternative comes into view.

Federal investments in materials research, physics, and chemistry are already leading to possible alternatives that range from radical single-atom transistors, to optical devices, to exotic chemical fiber switches. H.R. 2086 should encourage funding agencies to emphasize and strengthen these basic research areas and, even more important, to explore more alternatives.

Basic research problems as challenging as the silicon limit exist for technologies that determine transmission speeds, memory, and lithography. In all these cases, the role of government should be to uncover ideas that have the possibility of overcoming the technological barriers. Then, as industry nears those barriers, it can pursue the most promising possibilities. It is a symbiotic relationship: industry is attentive to immediate market pressures; the federal government makes the riskier investments that assure long-term competitiveness. Industry invests in the present; the government invests in the future. Legislation should make that difference clear.

Congress should demand that agencies identify those basic research questions that must be addressed if industry is going to remain competitive into the next century. No counterpart to H.R. 2086 has received committee action in the Senate. However, the Senate had recently passed a bipartisan bill, S. 296, that had 42 cosponsors, including majority and minority leaders Senators C. Trent Lott (R–MS) and Thomas Daschle (D–SD). Like H.R. 2086, S. 296 authorizes increases in the federal spending for science. However, unlike the House bill, S. 296 makes a broad statement concerning the federal role in our nation's research enterprise. Rather than simply supporting competitive industries, the bill recognizes that the role of government should be to help stimulate the next great competitive industry. Whatever bill finally becomes law must represent more than just political jockeying.

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