Inaction on Technology Programs Stirs Congress

A framework for enhancing the Commerce Department's role in civil technology is unfunded and leaderless

FRUSTRATION LEVELS are rising in the science community—as they are in many others—over the glacial pace of the Bush Administration's first few weeks in office. Many key posts, from the President's science adviser on down, remain unfilled 11 weeks after President Bush was sworn in, and some important policy decisions are now awaiting attention.

In particular, a new thrust in federal support for industrial research that appeared to be in the makings last year has stalled. After a decade of rising concern about the erosion of America's technological leadership, Congress approved legislation last fall to beef up the Commerce Department's role in supporting civilian technology. No funds have been requested by either the Reagan or Bush administrations to fund the department's new initiatives, however, and nobody has yet been appointed to head the effort.

This lack of action is provoking impatience on Capitol Hill. "The Administration just does not have a technology policy," laments George Brown (D–CA), a veteran legislator who has fought for years to increase the federal government's involvement in the development of key civilian technologies. A senior aide to the House Committee on Science, Space, and Technology talks of "general frustration" among committee members and says "we long for somebody to talk to over there [in the Administration]."

Impatience is also apparent in industry. Mary Good, a vice president of Allied-Signal, Inc., calls the effort to strengthen the Commerce Department's technology programs "an excellent move," but says there is now "a real need to get some leadership in place" to manage the effort. "In my view, it is pretty urgent," she says.

The sense of urgency is not apparent in the White House, however. Even with an engineer, John Sununu, as Chief of Staff, there seems no "corporate" memory of last year's "emerging national consensus" on the need for closer links between the federal government and private industry to develop commercially important technologies. Those words came in a speech last September by Robert White, president of the National Academy of Engineering, that gained wide attention.

White noted that the prevailing view until recently has been that the federal government should support basic research and leave private industry to look after technology. But this, said White, "no longer conforms to the facts."

"We cannot continue to tilt at windmills, spend our time debating only science priorities, however important, arguing that a free-market economy will by itself secure our industrial future, all the while watching a spiraling descent of our technological capabilities relative to other nations," White said.

The Defense Department has acted like a true believer. In the past few years, the Defense Advanced Research Projects Agency, or DARPA, has become the lead agency supporting industrial research on a variety of cutting-edge technologies, including semiconductor manufacturing, high-temperature superconductors, neural networks, and high-definition television. The prime reason DARPA is supporting these technologies is that they are important for weapons systems, but it has also explicitly cited its interest in ensuring that American industry is competitive in civilian markets.

"The Department of Defense has become the nation's de facto Ministry of Technology and Industry by default," says White. "While we should be thankful that some agency is taking the initiative, the Defense Department is not where it should be." In January, the council of the National Academy of Engineering—a body about equally divided between academic engineers and senior engineers from the corporate world—issued a statement urging the Bush Administration to build upon the initiatives launched last year by Congress in giving the Commerce Department the primary respon-

A Focus on Advanced Television?

One area that might prove an exception to the lack of federal support for civilian technology development is high-definition television (HDTV). In the past few months, HDTV has become a political cause célèbre in Washington. A dozen House members, led by representatives Mel Levine (D–CA) and Don Ritter (R–PA), have formed an "HDTV Caucus" to push for federal support to help develop U.S. capabilities in advanced television, and Ritter and George Brown (D–CA) have each introduced legislation that would provide $100 million a year to fund industrial consortia working on some of the key technologies. Brown, who sits on the House subcommittee that oversees NIST, may try to attach his bill to legislation later this month authorizing funds for the agency.

The political attention focused on HDTV is being stimulated by forecasts from the American Electronics Association that HDTV receivers could constitute a multi-billion dollar a year market early in the next century. They will also be chock full of memory chips and microprocessors, so their manufacture could have ripple effects throughout the economy, driving technological innovation in key sectors such as semiconductors. "To miss out on HDTV is to miss out on the 21st century," says Ritter.

The United States currently lags behind both Japan and Europe in HDTV development, thanks in part to a $500-million program funded by the Japanese government and a $200-million effort sponsored by the European Economic Community. At present, the only program funded by the U.S. government is a $30-million effort by DARPA to develop high-resolution displays. DARPA requested proposals from industry last September; it received 87, entailing a total of just over $500 million if they were all funded. Hence the interest in getting a civilian HDTV effort going.

"It's kind of absurd that there's an HDTV caucus in Congress when there should be a high-technology caucus," says Kenneth Flamm of the Brookings Institution. But many of those supporting greater federal involvement in HDTV believe that what emerges could provide a model for other areas. "They see this as the shock troops landing on a beach that has to be invaded," says Flamm. ■ C.N.

sibility for supporting civil technology.

The department's new responsibilities were written into last year's trade bill. The legislation provided a framework for private companies and the federal government to work together through joint ventures or industrial consortia to develop technologies likely to be important to the civilian economy. Japan and European countries have made such arrangements a centerpiece of their technology policies.

The trade bill resulted in a bureaucratic reshuffle that raised the political status of the department's existing technology programs, bringing them together into a Technology Administration headed by an Undersecretary for Technology. The venerable National Bureau of Standards was given a new name (and a more euphonious acronym), the National Institute of Standards and Technology (NIST), and new authority to enter into joint research ventures with industry.

The changes had the enthusiastic backing of then Commerce Secretary William Verity. He gave Ernest Ambler, the director of the bureau of standards, the job of getting the new Technology Administration up and running during the transition to the Bush Administration. Ambler, who had already announced plans to retire, agreed to stay on until 1 April, by which time President Bush should have picked his own man or woman to lead the effort.

True to his word, Ambler left last week. But nobody has yet been nominated as Undersecretary for Technology. NIST, too, has been operating under an acting director for 3 months, ever since Ambler took on the Technology Administration job, and no replacement has been named. Moreover, not only did Reagan's lame-duck budget contain no money to carry out the new programs but NIST's budget for its existing programs was also trimmed.

Ambler says that, given the pressure to reduce the federal deficit, the lack of funding for the new initiatives is not surprising. He views as far more serious the slowness in making appointments, especially the President's science adviser. "You have to question whether there is any thought being given to how we are going to deploy technology in this competitiveness game," he says.

Representative Brown and others who have championed the cause of technology policy concede that it will be very difficult to break loose substantial new funding next year for the Commerce Department programs, given the pressure to cut the deficit, but they will nevertheless keep up the pressure. Says a committee aide, "it is difficult to believe that having authorized and supported the program, the committee will not fund it." ■ COLIN NORMAN

Budget Squeeze Causes Fission in Fusion Labs

Divisions have appeared among fusion researchers over the nation's fusion strategy; the timing of the next major machine and its potential impact on other research are at issue

STEVEN COWLEY'S DREAM is to replicate the hydrogen fusion process of the sun. For 8 years, dating back to the day he graduated from the University of Oxford, Cowley has pursued this goal at the Princeton Plasma Physics Laboratory, and he says he's ready to spend his entire professional life on it. But Cowley—and many of his peers working on other, smaller-scale fusion projects across the United States—are getting a bit nervous about their future.

For 5 years running, Congress has refused to increase funding for the $350-million-a-year magnetic confinement fusion program. This has already caused a number of research programs to be stretched out, and a reshuffling of research priorities. The result: layoffs at some laboratories. "Budgets are down to a level now where every time it shrinks it cuts into the core of people who have dedicated their careers to this program," observes Bruce Montgomery, associate director of the Massachusetts Institute of Technology's Plasma Fusion Center.

Yet more worrisome to many physicists and engineers is fusion's version of the big-science dilemma: what will happen to many smaller research programs in physics, engineering, and nuclear science if Cowley's colleagues at Princeton are able to convince Congress to provide the funding to move ahead quickly with construction of the Compact Ignition Tokamak (CIT)—the fusion experiment of the 1990s that could cost $700 million to build?

Project managers at institutions around the country have told *Science* they fear that ongoing research projects will be in jeopardy if the Department of Energy (DOE) tries to shoehorn the machine into the fusion budget without more funding to accommodate it. But nobody expects the overall fusion budget to grow much in the current climate. And with the federal budget under pressure, it will be increasingly difficult to persuade Congress to pump more resources into a program that is not expected to make significant contributions to the nation's electrical grid before the middle of the next century.

And now along comes "cold fusion." The recent media hoopla surrounding claims that fusion has been achieved by an entirely different approach (see page 143) may focus more attention on the huge costs of the magnetic fusion program.

"Some folks are getting a little disinterested in [magnetic] fusion," concedes Harold Forsen of the Bechtel Group, Inc., a Department of Energy contractor. Indeed, fusion program leaders in the national laboratories across the country already are bracing for a possible $20-million reduction in the 1990 fusion research budget by Congress.

All this is carving deep divisions in the fusion research community over not merely the pace and timing of the CIT but over the nation's fusion strategy in general.

Tensions within the fusion community have been heightened since Robert O. Hunter took over last fall as head of the Department of Energy's Office of Energy Research, which funds the magnetic fusion program. Late last year, Hunter reordered some research priorities by shifting funds into basic studies of the mechanisms governing the transfer of heat and particles across magnetically confined plasmas. Although there is general agreement that increased attention to these areas is warranted, core

David O. Overskei: *Recommended a 2-year delay in constructing the CIT.*