OTA Report Brief

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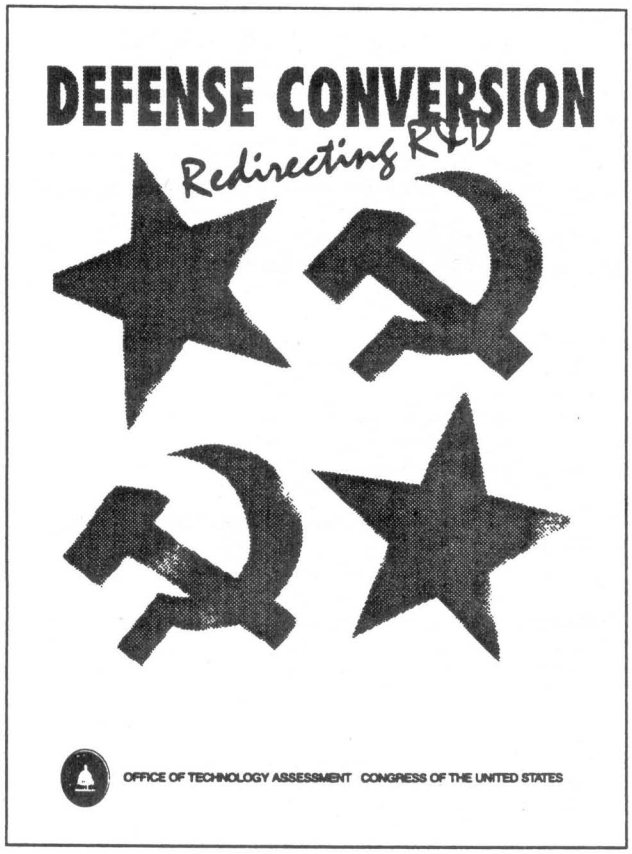
Defense Conversion: Redirecting R&D



The end of the Cold War, by dispelling the threat of global nuclear conflict, allows the freedom to define economic well-being as a part of national security, and brings the opportunity to adopt new national initiatives aimed at building a stronger economy. However, economic adjustment to a post-Cold War world will not be easy or painless. Deep, sustained cuts in defense spending involve hardships—greater perhaps than the relative size of the cutback suggests—because the U.S. economy is burdened with more debt and higher unemployment than in times past, and is challenged as never before by foreign competitors. First aid to workers and communities, in the form of retraining, reemployment, and redevelopment assistance, can help them through the transition. But the best conversion strategy is the broadest: investment in programs that advance technology, improve competitiveness, and invigorate economic growth.

Government-funded research and development (R&D) has an important part to play in a broad conversion strategy. Defense has historically dominated government R&D spending, and is still 60 percent of the total. As the defense imperative declines, a key question is whether the Nation can put to good use on the civilian side of the economy research talents and institutions that were formerly devoted to military aims. That is the subject of Part One of this report. Many R&D institutions—in government, industry, and universities—have been part of the defense effort, but the report concentrates on government research institutions, as they are most clearly and directly influenced by government policy. It focuses in particular on the Department of Energy's (DOE's) three multiprogram nuclear weapons laboratories: Lawrence Livermore, Los Alamos, and Sandia National Laboratories. These very large labs—with combined operating budgets of $3.4 billion a year and staffs of more than 24,000—face a clear need to change from what has been their central mission for 50 years, the design of nuclear weapons.

Proposals for the weapons labs' future range from radical downsizing, with possible closure of at least one lab, to using their talents and resources for new national initiatives devoted to peacetime purposes. Whatever their long-term future, there could be a much larger place than in the past for cost-shared R&D projects between the labs and industry. Interest by both parties in such projects is at an all-time high. Every DOE request for joint proposals from the labs and industry brings in many times more proposals than can be funded, similar to National Institutes of Health and National Science Foundation research programs. This kind of interest is an indication that the program is worthy of interim support, while we await more appropriate measures of the worth of jointly-funded R&D projects between the weapons labs and industry. Specifically, such projects should eventually yield an appropri-

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ate number of commercializable technologies, and some measurable benefits to the U.S. economy, before cooperative R&D is judged successful.

The DOE process of negotiating cooperative research and development agreements (CRADAs) has improved with experience, but in early 1993 delays and difficulties were still serious enough to raise questions whether industry enthusiasm would last. While some informed critics think the whole program should be scrapped or drastically revamped, most have concentrated on solving problems that result in delay. Many of the problems (e.g., rights to intellectual property) involve genuine conflicts in judgments about where the public's interest lies, and have proved difficult to solve. In addition, there is a tension between fast action and assuring sufficient oversight to give proper strategic direction to a large, visible cooperative government/industry R&D program. Originally budgeted at $141 million in 1993, funding for cooperative projects could rise to $187 million for the weapons labs and $57 million for other DOE labs, assuming Congress agrees to Administration requests. The Administration and many in Congress favor eventual funding of CRADAs at DOE labs on the order of $500 million to $1 billion a year.

In the longer run, the labs' existence is best justified if they serve missions that are primarily public in nature. One approach would be for the Federal Government to set R&D priorities for selected national initiatives that fulfill public purposes, and then allocate government funds to whatever performers, public or private, can make the best contributions. Up to now, no Federal agency has had both the responsibility and the authority to coordinate technology development efforts in areas of national importance. An agency or Cabinet-level department might be designated or created for the purpose.

Part Two of this report illustrates several broad new initiatives the Nation might adopt to serve peacetime goals. The case chosen for analysis: transportation. The report explores two systems that offer greater energy efficiency, reduced pollution, and lesser dependence on foreign oil. The two contrasting analyses are: 1) ultraclean cars, powered by batteries or a combination of batteries and fuel cells, and 2) high-speed ground transportation, including steel-wheel cars on rails and magnetically levitated vehicles on guideways.

Most transportation policy issues are outside the realm of defense conversion. From the standpoint of defense conversion, the important issues are advancing critical technologies, promoting world class industries, and creating good jobs—benefits provided by defense spending in the past—plus the potential for using some of the human talents and resources formerly devoted to defense. Nonpolluting cars, though farther from technological success than high-speed ground transportation systems, hold greater promise for pushing technological frontiers and, if they succeed, eventually creating a large number of well-paid productive jobs. There may, however, be other good public policy reasons for government support of high-speed ground systems.

However desirable they may be, it is not likely that any of these transportation systems would create nearly enough jobs at the right time and in the right places to compensate for the hundreds of thousands of defense jobs being lost as the Nation adjusts to post-Cold War military budgets. Some of the initiatives could use the talents of people now working in the defense sector—especially research scientists and engineers—but the match would not be perfect. The best conversion strategy is multifaceted: investment in programs that train workers well, help businesses perform better, promote technology advance, and support the growth of high value added industries and jobs.

This is the second of two OTA reports on the implications for the U.S. civilian economy of the end of the Cold War. The first report, *After the Cold War: Living With Lower Defense Spending*, considered the effects on defense workers, defense-dependent communities, and defense companies.

Copies of the report for congressional use are available by calling 4-9241.

Copies of the report for non-congressional use can be ordered from the Superintendent of Documents, U.S. Government Printing Office, P.O. Box 371954, Pittsburgh, PA 15250-7954, (202) 783-3238. The GPO stock number for the OTA report, "Defense Conversion: Redirecting R&D," is 052-003-01324-1. The price is $13.00.

Summaries of the report are available from OTA's Publications Office. Address: OTA, U.S. Congress, Washington, DC 20510-8025, (202) 224-8996.

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