

An hourglass-shaped graphic with a globe inside. The top bulb is dark blue, and the bottom bulb is light blue. The globe is centered in the narrow neck of the hourglass. The text is centered within the hourglass.

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The Advanced Technology Program

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Abstract. President's FY2008 budget request did not include financing for ATP. The FY2008 Consolidated Appropriations Act, P.L. 110-161, replaces ATP with the Technology Innovation Program (TIP) and provides \$65.2 million (with an additional \$5 million in ATP FY2007 unobligated balances), 17.6% less than the previous fiscal year. P.L. 110- 69, the America COMPETES Act, authorized the creation of TIP.

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CRS Report for Congress

The Advanced Technology Program

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Summary

The Advanced Technology Program (ATP) was created by P.L. 100-418, the Omnibus Trade and Competitiveness Act of 1988, to encourage public-private cooperation in the development of pre-competitive technologies with broad application across industries. Administered by the National Institute of Standards and Technology, a laboratory of the Department of Commerce, this activity has been targeted for elimination as a means to cut federal spending. Since FY2000, original House-passed appropriation bills have not included funding for ATP. Many of the Administration's budget requests have proposed termination of the program. However, ATP continued to be supported, although at levels below that achieved in FY1995 when the activity was expanded significantly. In FY2007, the program was funded at \$79 million. The President's FY2008 budget request did not include financing for ATP. The FY2008 Consolidated Appropriations Act, P.L. 110-161, replaces ATP with the Technology Innovation Program (TIP) and provides \$65.2 million (with an additional \$5 million in ATP FY2007 unobligated balances), 17.6% less than the previous fiscal year. P.L. 110-69, the America COMPETES Act, authorized the creation of TIP.

Program Rationale

Title V of the Omnibus Trade and Competitiveness Act (P.L. 100-418) established the Advanced Technology Program (ATP). This effort grew out of concerns over the competitiveness of American companies in the global marketplace. While numerous factors affect the rate of technical progress in an economy, what was seen as critical is how quickly and successfully science and technology are transformed into new or better products, processes, or services. The commercialization and diffusion of goods and services stood out as significant problems in the ability of U.S. industries to compete.

Underlying the structure of ATP was an effort to foster cooperation among government, industry, and academia to facilitate the generation of new technologies for the commercial market. While opponents argue that joint ventures stifle competition, proponents assert that they are designed to accommodate the strengths and responsibilities of various sectors. Collaborative projects attempt to utilize and integrate what the

participants do best and to direct R&D activities toward the goal of meeting marketplace demands. Joint endeavors are seen as reducing risks and costs while permitting work that crosses traditional boundaries of expertise and experience.

Program Operation

The Advanced Technology Program was designed “to serve as a focal point for cooperation between the public and private sectors in the development of industrial technology” and to help solve “problems of concern to large segments of an industry,” as noted in the Conference Report to accompany the bill. Placed within the National Institute of Standards and Technology (NIST), in recognition of the laboratory’s ongoing relationship with industry, ATP provided seed funding to single companies or to industry-led consortia of universities, businesses, and/or government laboratories for development of generic (broad-based), pre-competitive technologies that have many applications across industries. Awards, based on technical and business merit, were for high-risk work past the basic research stage but not yet ready for commercialization. Market potential was an important consideration in project selection. Scientific and technical review generally was performed by federal and academic experts. Business plan assessments were made by individuals from the private sector.

Awards were for either product or process technology development. Individual firms were restricted to funding of \$2 million over three years. Money was to be used only for direct R&D costs. Large firms provided at least 60% of total (direct and indirect) projects costs; small and medium-sized companies were not required to cost-share direct costs. Joint ventures could receive up to five years of financing for any amount limited only by availability. In such cases, the private sector provided more than 50% of funding. While universities and federal laboratories could participate in collaborative work, the ATP grant was made solely to companies. P.L. 102-245 modified the original law and required that the recipient of an ATP award be a firm that is U.S.-owned (“a company that has a majority ownership or control by individuals who are citizens of the United States”) or a business that is incorporated in the United States and has a parent company established in a country that affords American firms reciprocal opportunities.

According to NIST, through the end of 2007, 824 projects were funded, of which about 28% were joint ventures. Approximately \$2.4 billion in federal funds have been matched by \$2.2 billion from the private sector. Small businesses or cooperative efforts led by such firms made up almost 68% of the awardees. The first four competitions (ending August 1994) were general in nature. In 1995, NIST restructured part of ATP to focus on various groups of projects in “well-defined” programmatic areas designed for long-range support selected in conjunction with industry. Since FY1999 one competition has been held in all areas of technology.

The America COMPETES Act, P.L. 110-69, authorized a new Technology Innovation Program (TIP) to replace ATP. The FY2008 Consolidated Appropriations Act, P.L. 110-161, provides funding for TIP. While similar to ATP in the intent to promote high-risk R&D that would be of broad-based economic benefit to the Nation, there are several differences in the operation of the new activity. Support under TIP is limited to small and medium-sized businesses whereas grants under ATP were available to companies regardless of size. In addition, in the Advanced Technology Program, joint ventures were required to include two separately owned for-profit firms and could include

universities, government laboratories, and other research establishments as participants in the project but not as recipients of the grant. In the TIP initiative, a joint venture may involve two separately owned for-profit companies but may also be comprised of one small or medium-sized firm and a university (or other non-profit research institution). A single company could receive up to \$2 million dollars for up to three years under ATP; under TIP, the participating company (which must be a small or medium-sized business) may receive up to \$3 million for up to three years. In ATP, small and medium-sized companies were not required to cost share (large firms provided 60% of the total cost of the project) while in TIP there is a 50% cost sharing requirement which, again, only applies to the small and medium-sized businesses that are eligible. There were no funding limits for the five-year funding available for joint ventures under ATP; the TIP limits joint venture funding to \$9 million for up to five years. The Advisory Board that was created to assist in the Advanced Technology Program included industry representatives as well as federal government personnel and representatives from other research organizations. The Advisory Board for the Technology Innovation Program would be comprised of only private sector members.

In its first year, FY1991, ATP was funded at \$36 million. Appropriations increased to \$48 million in FY1992, \$67.9 million in FY1993, and \$199.5 million in FY1994. For FY1995, financial support expanded significantly to \$340.5 million (including rescissions). Funding for FY1996 was \$221 million, \$225 million in FY1997, and \$192.5 million in FY1998. Congress provided \$197.5 million in FY1999 (including rescissions). In FY2000, the appropriations bill originally passed by the House included no funding for ATP, since, as stated in the accompanying report, “the program has not produced a body of evidence to overcome those fundamental questions about whether the program should exist in the first place.” However, ATP was financed \$142.6 million for FY2000. The following year, again the original House-passed appropriations bill did not fund the program, although \$145.7 million was ultimately appropriated.

The Bush Administration’s FY2002 budget proposed suspension of new ATP projects pending a program evaluation. The initial appropriations bill passed by the House terminated ATP; final legislation financed the effort at \$184.5 million. The following fiscal year \$178.8 million was appropriated (after rescissions). In FY2004, both the President’s budget request and the original House-passed appropriations bill provided no support for the program; however ATP was funded at \$170.5 million after mandated rescissions. While the FY2005 budget proposal and the original appropriations legislation passed by the House once again did not include funding for ATP, \$136.5 million was provided (after mandated rescissions). This situation held for the FY2006 appropriations process, although \$79 million (after mandated rescissions) was finally appropriated by Congress. For FY2007, the Administration’s budget did not include funding for ATP nor did the appropriations bill initially passed by the House and reported from the Senate Committee on Appropriations during the 109th Congress. Final FY2007 legislation provided \$79 million for the program.

The President’s FY2008 budget request contained no support for ATP. The initial FY2008 appropriations bill that passed by House, H.R. 3093, would have funded ATP at \$93.1 million while the Senate-passed version provided \$100 million, \$30.8 million of which was to be directed toward other programs in the Federal Bureau of Investigation and the U.S. Marshals Service. The final FY2008 appropriations legislation, P.L. 110-161, finances the new Technology Innovation Program at \$65.2 million (with an

additional \$5 million from FY2007 ATP unobligated balances). The TIP initiative replaces ATP.

Results

NIST has undertaken numerous analyses of ATP; the General Accounting Office (GAO, now the Government Accountability Office) has also studied the program. In its first evaluation (1994), NIST concluded the program had stimulated research that would not have been done without the federal support; that R&D cycles within companies have been abbreviated; and that “valuable business alliances” had been created.¹ However, in a May 1995 report, GAO argued that these conclusions can not be adequately substantiated by the information provided in the NIST study on which they are based.² Acknowledging that it was too early to determine the long-term impact of ATP, the GAO report stated that some of the indicators NIST utilized “may create false expectations of the program’s economic success.” NIST vigorously defended its methodology.

Additional studies funded by NIST found that ATP shortened R&D cycles by half and accelerated technological progress within the firm; stimulated productive collaborative activities among companies and between firms and universities; facilitated commercialization; and increased private sector investment in high risk technology development.³ An April 2000 progress report reinforced these earlier findings.⁴ This study indicated that “participants in 261 projects have identified more than 1,200 different applications (or uses) of the technologies under development,” and that the majority of these are new solutions to market needs or improvements in existing products or processes. Product cycles are being reduced, and while 24% of respondents said that they would not have undertaken the project without ATP funding, most others noted that the R&D would have been significantly slower without such support. NIST found that “organizations are pursuing different R&D than they would have undertaken without ATP funding,” and that this work is more technically advanced and risky. The ATP financing also stimulated additional private sector money in these technical areas than otherwise would be the case. Over half of the companies are now able to make a new or improved product. In March 2000 testimony, Raymond Kammer, then director of NIST, stated that approximately 120 new technologies have been commercialized. According to NIST,

¹ National Institute of Standards and Technology, *Setting Priorities and Measuring Results at the National Institute of Standards and Technology*, January 31, 1994.

² General Accounting Office, *Performance Measurement, Efforts to Evaluate the Advanced Technology Program*, GAO/RCED-95-68, May 1995.

³ Silber and Associates, *Company Opinion about the ATP and Its Early Effects*, January 30, 1995; *Acceleration of Technology Development by the Advanced Technology Program: The Experience of 28 Projects Funded in 1991*, by Frances Jean Laidlaw, for the National Institute of Standards and Technology, Economic Assessment Office, October 23, 1997; National Institute of Standards and Technology, *Advanced Technology Program: Development, Commercialization, and Diffusion of Enabling Technologies*, by Jeanne W. Powell, December 1997; National Institute of Standards and Technology, *Advanced Technology Program Performance of Completed Projects, Status Report Number 1*, by William F. Long, March 1999.

⁴ National Institute of Standards and Technology, *Development, Commercialization, and Diffusion of Enabling Technologies: Progress Report*, by Jeanne W. Powell and Karen L. Lellock, April 2000.

more than 60% of ATP projects have resulted in commercial products and processes available in the marketplace.⁵

The concern over whether ATP supports projects that could reasonably attract private sector investment has been an issue throughout the life of the program. In a report examining award winners and “near winners” during the first four years of ATP, GAO found the program funded both projects that would not have progressed without this federal support and those that would have been financed by the private sector.⁶ Half of the awardees stated that they would have continued without ATP financing. Of the “near winners,” 50% pursued their efforts in the absence of federal money but took longer to achieve their goals. According to GAO, while 63% of the applicants did not look elsewhere for funds, about half of the applicants who did “were told by prospective funders that their projects were either too risky or ‘precompetitive’ — characteristics that fulfill the aims of ATP funding.” Respondents also noted that the program facilitated development of joint ventures to pursue ATP activities.

A study undertaken by the American Enterprise Institute concluded that ATP “has had only limited success” in choosing projects that could not raise private sector funds. According to the authors, this has occurred because companies are not interested in pursuing R&D that fails to complement work performed for profit. In addition, the ATP selection criteria focus on commercial sales and job creation, not on projects for which there are “broad social benefits” and insufficient private investment. An April 2000 report by GAO, reinforced by May 26, 2005 testimony, noted that “two inherent factors in ATP’s current award selection process — the need to guard against conflicts of interest and the need to protect proprietary information — make it unlikely that ATP can avoid funding research already being pursued by the private sector in the same time period.”⁷

Issues and Observations

There have been efforts in the past several years to terminate the Advanced Technology Program. These actions, along with additional attempts to withdraw government support for other technology development efforts, appear to reflect a philosophy that eschews direct federal financing of private sector R&D efforts aimed at the commercialization of new technologies and production processes. Such activities are seen by opponents as “industrial policy,” the means by which government rather than the marketplace “picks winners and losers.” Instead, measures that would occasion a better investment environment for industry to expand their innovation-related efforts would, proponents argue, be preferable to government funding.

The current approach involves varied mechanisms to facilitate technological advancement. Legislative initiatives have resulted in a body of laws, programs, and

⁵ National Institute of Standards and Technology, *ATP is Meeting Its Mission: Evidence From ATP Evaluation Studies*, available at [<http://www.atp.nist.gov/factsheets/1-a-1.htm>].

⁶ General Accounting Office, *Measuring Performance: The Advanced Technology Program and Private-Sector Funding*, GAO/RCED-96-47, January 1996.

⁷ General Accounting Office, *Advanced Technology Program: Inherent Factors in Selection Process Could Limit Identification of Similar Research*, GAO/RCED-00-114, April 2000, 5.

policies that involve both indirect and direct measures to stimulate technology advancement in the private sector. Indirect incentives include a research and experimentation tax credit; changes to the antitrust laws to encourage collaborative R&D and cooperative manufacturing ventures; alterations of patent ownership policies to facilitate government-industry-university interaction; and practices to promote technology transfer. Direct measures involve, among other things, federal funding for ATP and the Small Business Innovation Research Program. These cost-shared programs have been supported, in part, because of their potential contribution to the country's national or economic security.

Proposals to terminate or severely limit ATP have renewed the debate over the role of the federal government in promoting commercial technology development. In arguing for less direct federal involvement, advocates believe that the market is superior to government in deciding technologies worthy of investment. Mechanisms that enhance the market's opportunities and abilities to make such choices are preferred. It is suggested that agency discretion in selecting one technology over another can lead to political intrusion and industry dependency. On the other hand, supporters of direct methods argue that it is important to focus on those technologies that have the greatest promise as determined by industry and supported by matching funds from the private sector. They assert that the government can serve as a catalyst for cooperation.

Technological progress is important to the nation because of its contribution to economic growth and a high standard of living. How best to achieve this continues to be debated. Critics viewed ATP as a means for a federal agency to select commercial firms and/or technologies for support. They maintain that the absence of market-generated decisions will result in technologies that can not be utilized productively by participating companies. Such a program encourages selection of well-written proposals rather than assistance for truly important technologies. However, proponents stressed that ATP was market driven and that the technical areas for investment have been developed in conjunction with industry. In addition, companies were required to put up significant amounts of funding and survive a rigorous business review; procedures that made the Advanced Technology Program different from other federal efforts. Replacing ATP with the Technology Innovation Program may be one response to criticism that large firms should not be the recipient of this form of federal research funding, one that should be reserved for small and medium-sized companies that do not have access to the private capital available to major corporations.