

Statement for the Record by

**Larry James
SBIR/STTR Program Manager
U.S. Department of Energy**

Submitted to the

**Subcommittee on Technology and Innovation
Committee on Science and Technology
U.S. House of Representatives**

**Hearing on
Small Business Innovation Research Reauthorization**

April 26, 2007

Mr. Chairman and Members of the Committee: thank you for giving the Department of Energy (DOE) the opportunity to provide this Statement for the Record about the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs at the Department.

The DOE Office of Science (SC) manages the SBIR and STTR programs for the Department and has done so since the SBIR program was formed in 1982 and the STTR program in 1992. In addition to SC, six other DOE programs participate in the SBIR and STTR programs: the Offices of Fossil Energy, Energy Efficiency and Renewable Energy, Nuclear Energy, Environmental Management, Defense Nuclear Nonproliferation, and Electricity Delivery and Energy Reliability. The Department's naval reactors and weapons activities programs are exempt by law and do not contribute to SBIR and STTR programs.

The SBIR/STTR programs are viewed within the Department like any other research and development (R&D) program, namely, as a vehicle by which the Department accomplishes its R&D objectives. The Department has benefited from small business participation through the research and resultant new knowledge and technologies developed by small businesses that have supported various Department R&D activities over the years. Examples of commercialization successes from the programs include development of new photovoltaic systems for utility scale solar energy production, shock-resistant and temperature-tolerant ceramics for more energy efficient engines, and fast-growing hybrid poplar trees as a sustainable and economical biomass energy source. Successful collaborations between small businesses and the DOE laboratory complex have also led to new insights and innovative technologies that enable advancement of the Department's program missions; for example, technologies that will significantly improve the performance of current and future DOE scientific user facilities.

Program Effectiveness

The statutory SBIR and STTR programs have several purposes: (a) to stimulate technological innovation; (b) to use small businesses to meet Federal R&D needs; (c) to foster and encourage participation by socially and economically disadvantaged small businesses; and (d) to increase private sector commercialization of innovations derived from Federal R&D.

In accordance with the U.S. Small Business Administration's (SBA) SBIR Policy Directive, the SBIR program is administered in three phases. Phase I is to evaluate the scientific or technical merit and feasibility of ideas that appear to have commercial potential or meet the internal needs of the Department. Phase II builds on Phase I work and comprises the core research and development effort. Phase III refers to work that derives from, extends, or logically concludes efforts performed under SBIR funding agreements, but is not itself funded by the SBIR program. Phase III work is typically oriented towards private sector commercialization or direct transition of the SBIR research or technology into the Department's research complex. That is, the SBIR funding pays for research or R&D meeting DOE objectives (Phases I and II); non-SBIR capital provides follow-on developmental funding to meet commercial or program specific objectives (Phase III).

The SBIR and STTR programs both involve a two-phased research approach. The major difference between the SBIR and the STTR programs is that STTR grants must involve substantial cooperative research collaboration between the small business and a research institution. At least 40 percent of the research or analytical effort must be allocated to the small business, and at least 30 percent of the effort must be allocated to a single research institution. The percent set-aside for the STTR is small, 0.3 percent, relative to the SBIR set-aside at 2.5 percent of Federal agency extramural R&D budgets.

The Department's SBIR and STTR programs' goals include: 1) funding high quality projects with relevance to the Department's mission needs; 2) increasing private-sector commercialization and Departmental transition of technology developed through DOE SBIR-supported R&D; 3) stimulating technological innovation in the private sector; and 4) improving the return on investment from federally-funded research for economic and social benefits to the nation.

The Department believes its SBIR and STTR programs are meeting these objectives. SBIR and STTR program performance compares favorably with that of other DOE research programs. The DOE SBIR and STTR programs have and continue to support high-quality, competitive R&D, which results in spin-off companies, new technologies, and knowledge which all contribute to advancing DOE missions.

DOE's SBIR program is also a model for the provision of commercialization assistance. According to the Small Business Administration (SBA), DOE was the first agency to offer commercialization assistance to awardees, beginning in 1990. Awards from the SBIR program help small businesses attract outside investment by affirming that the companies have excellent technical capability, thus reducing some of the uncertainty involved in early-stage investment. Several comprehensive reviews of the Federal SBIR and STTR programs by the Government

Accountability Office (GAO) have found it to be successful in enhancing the role of small businesses in Federal R&D across the participating agencies, stimulating commercialization of research results, and supporting the participation of small businesses (Testimony Before the Subcommittee on Environment, Technology, and Standards, Committee on Science, House of Representatives, *Federal Research: Observations on the Small Business Innovation Research Program*, June, 28 2005, GAO-05-861T, and references therein).

The efficiency and effectiveness of the DOE SBIR and STTR programs could potentially be improved with two changes in the allocation of set-aside funds:

(1) Increase the provisions for discretionary technical assistance within the existing set-aside allowed by law under SBIR. SBA-directed funding limits in Phase I and Phase II are not adequate to support a strong technical assistance program, including commercialization assistance. Currently up to \$4,000 in Phase I (above the awarded amount) can be used per award for commercialization assistance activities and up to \$4,000 per year per award in Phase II (included as part of the awarded amount) can be used towards these activities. SBIR Phase II recipients have indicated in qualitative surveys that the commercialization assistance programs and services offered by DOE's SBIR program are valuable to their product development and commercialization efforts. Also, quantitative data from DOE's SBIR Commercialization Opportunity Forum Program, a program that helps companies develop a business plan and interact with potential strategic allies and investors, indicate that more than 50 percent of the graduates from the program received follow-on investment within 18 months.

(2) Make a small fraction of the existing set-aside available for agency administrative purposes. Appropriate operating resources are important to maintain and continue to improve the SBIR and STTR programs. The use of a small percentage of the SBIR and STTR programs' funds for administrative purposes could improve their effectiveness by providing the resources for better evaluation of the successes of participating small businesses and their impacts on DOE mission goals. For example, such resources would allow program staff to improve Phase III follow-up, track commercialization and non-commercialization successes, and provide more outreach to increase small business participation. More comprehensive, long-term data collection would allow better assessment of the results of the programs and enable the programs to adjust management practices as appropriate.

A key element in the success of the SBIR and STTR programs is the flexibility of the SBA Policy Directive which lays out the basic rules by which each agency manages its mission specific programs. Each of the Federal agencies which participate in the SBIR/STTR program manages its program through processes that work best for that agency. Efforts to restrict this framework, which has evolved over the 24 year history of the SBIR Program, would be a step backward and would limit the agencies' ability to meet the goals of the program

Award Levels

The SBA is currently considering new award level upper limits for the SBIR program to account for inflation. In general, higher award level limits will give agencies added flexibility in

managing their programs and enable support of a broader range of innovative technology proposals.

Small Business Participation

Over the 24 years of its existence, the DOE SBIR Program has matured and evolved significantly. We have issued 25 Phase I solicitations, reviewed approximately 31,797 proposals, and selected for funding 4,413 Phase I projects and 1,816 Phase II projects. The SBIR budget for Fiscal Year 2006 was \$114 million. The Department received 1,309 Phase I grant applications from 809 companies, of which 1,021 were sent out for external peer review. We selected 260 applications for Phase I awards resulting in grants to 173 small businesses in 33 states. Sixty-seven of the 290 grantees were first time winners with DOE. Thirty-four of the 67 were first time applicants to DOE. Thirty-one applicants selected for funding were from socially and economically disadvantaged small businesses and thirteen were from small businesses located in a HUBZone (historically underutilized business zone). In FY 2006, the Department received 226 Phase II proposals and funded 123 awards to 96 small businesses. Approximately 95 percent of Phase I awardees submit Phase II proposals.

Below are additional statistics from prior years:

Phase I SBIR								
Year	Number of Application Submissions	External Peer Reviewed	Number of Awards	Number of Individual Companies that Submitted	Number of Companies with Funded Projects	First-time Awardees	Small & Economically Disadvantaged Small Business Awardees	HUBZone Awardees
2006	1309	1021	260	809	173	67	31	13
2005	1490	1037	259	823	179	85	26	7
2004	1312	857	247	736	187	83	31	14

Phase II SBIR

Year	Number of Application Submissions	External Peer Reviewed	Number of Awards	Number of Individual Companies that Submitted	Number of Companies with Funded Projects	First-time Awardees	Small & Economically Disadvantaged Small Business Awardees	HUBZone Awardees
2006	226	226	123	158	96	39	16	7
2005	227	227	107	175	93	39	11	4
2004	198	198	117	150	93	36	11	9

DOE actively participates in national, regional, and state sponsored outreach activities, as do other Federal agencies, to engage small businesses and provide information and resources to better position them to participate in the SBIR and STTR programs. These outreach activities generally consist of two- to three-day conferences featuring presentations and panel discussions involving agency program managers and experts in the areas of proposal preparation and budget formulation. One-on-one meetings with prospective small businesses are also provided to allow attendees to discuss their technology concepts and how they might address agency needs. Agency participation in these outreach activities is often limited, however, by an agency's limited administrative resources.

The DOE SBIR and STTR programs facilitate and participate in presentations and panel discussions at the Department's annual Small Business Conference. These conferences typically draw between 400-600 participants each year and have been successful in attracting a significant number of small and economically disadvantaged businesses that are strongly encouraged to consider SBIR and STTR program opportunities. Continued outreach efforts by the Federal agencies' programs are important. Likewise, efforts by State Economic Development Agencies have shown significant success in helping their small business communities pursue Federal SBIR and STTR funding opportunities.

Financing and Commercialization

Because the Department has flexibility to provide partial funding as soon as Phase II awardees are selected, we are able to minimize any gaps in financing under the SBIR and STTR phased award structure. Phase II awardees are typically selected within a reasonable period following their completion of the Phase I grant. The current SBIR Policy Directive encourages each agency to develop a program that reduces the time between issuance of SBIR Phase I and Phase II awards and provides the agency flexibility for optimal implementation.

As stated earlier, increasing the amount of the existing set-aside allowed for technical assistance, including commercialization assistance activities, could potentially improve the commercialization success of SBIR R&D supported by the Federal agencies. The Commercialization Opportunity Forum Program in which DOE SBIR grantees are invited to participate brings small businesses with promising technologies face-to-face with potential

investors. This program, conducted by a private organization competitively selected and under contract with DOE, provides small businesses the opportunity to work with professionals first to develop and refine a business plan and business plan presentation. Then small businesses are brought together with decision makers from appropriate partnering and funding sources in a two-day forum that includes both formal presentations and informal networking opportunities. While every small business supported by the DOE SBIR program theoretically has access to commercialization assistance services, in fact, because of resource limitations, not every small business is able to participate in the Opportunity Forum, which involves direct contact with private equity firms. Additional resources for commercialization assistance through programs like the Opportunity Forum could help more participating small businesses develop business plans for their technologies and access the private equity and investment markets essential to successful commercialization.

Multiple Venture Capital Majority Ownership

The Department recognizes the positive impact that opening up competition to multiple venture capital (VC) majority-owned small businesses may have on stimulating technology development, increasing private sector commercialization from Federal R&D, and meeting agency mission needs. DOE has concerns, however, with respect to how opening up the competition to multiple VC majority-owned small businesses may impact the participation of small businesses which lack the financial resources of multiple VC majority-owned companies. Because DOE provides financial assistance in the form of Phase I and Phase II research grants to the successful applicant, there is no financial risk to the company if the research and development of a proposed technology does not result in a commercial product in the near term. The financial risk to these companies comes in Phase III, once the SBIR and STTR programs' funding is no longer provided and small businesses must pursue outside financial resources for further development and commercialization.

Opening up competition to multiple VC-majority owned companies may have the effect of squeezing out new technology start-up businesses that have been the success stories of the SBIR and STTR programs and may limit the ability of the Federal program to increase the participation of small businesses in Federal R&D, particularly participation by socially and economically disadvantaged small businesses. Interested venture capital companies have sufficient opportunity to provide financial support to the small businesses directly through equity ownership once the technology has proven itself in Phase II. SBA is currently addressing this issue through its public rule-making process. SBA has issued an Advance Notice of Public Rule Making and is reviewing the pros and cons of a possible change in eligibility requirements.

Raising the Set-Aside Percentage

Since its inception, the Department has invested almost \$1.5 billion in SBIR/STTR Phase I and Phase II grants. In return, approximately 60 percent of Phase II-supported companies have earned a total of more than \$1.6 billion in sales and \$1.3 billion in additional Phase III development funding—67 percent of which came from non-Federal sources—helping the nation capitalize on its substantial R&D investment.

As the Committee considers SBIR Reauthorization, the issue of raising the set-aside percentage is likely to be a subject of debate. The Department of Energy works hard to maintain a strong and appropriately balanced core research program through R&D supported at universities, the DOE national laboratories, and U.S. small businesses. The Department believes the current set-aside is adequate. At a time when budgets are particularly constrained, we do not advocate increasing the set-aside for the SBIR and STTR programs. We are most concerned that such an increase would negatively impact other areas of the Department's research portfolio, including maintaining core research funding at universities. The Department recommends that, before any increase in the set-aside percentage is considered, improvements in program efficiency and effectiveness be explored – for example, through change to the allocation of existing set-aside resources to allow additional support for technical assistance and commercialization assistance, as well as for agency administrative expenses. Such changes may better position small businesses to develop and commercialize their technologies and maximize their contribution to agency mission needs without compromising agencies' broader mission commitments.

Conclusion

Again, Mr. Chairman and Members of the Committee, I want to thank you for the opportunity to provide this statement from the Department of Energy. We are committed to the SBIR and STTR programs which have proved their value over many years, and we look forward to working with this Committee and others on Reauthorization to continue and further improve their efficacy for the agencies which support them and the businesses which emerge and grow from them.