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RESULTS

# Reforming the Department of Energy's Small Business Innovation Programs

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## **AMERICAN ENERGY INNOVATORS NETWORK (AEIN)**

Energy entrepreneurs and the investors that support them are the lifeblood of our nation's energy innovation ecosystem, providing the creativity and bold thinking needed to address our multi-dimensional energy and climate challenges. Yet federal policies and programs intended to support their long-term success often fall short of meeting the needs of these crucial stakeholders.

To address this disconnect, the Bipartisan Policy Center is convening a group of emerging companies and investors to serve as a point of central coordination in bringing entrepreneurial voices and perspectives into federal energy policy initiatives and decision-making. Known as the American Energy Innovators Network (AEIN), the aim of the group is to provide practical, actionable input into real-time federal policy initiatives and help create a more effective partnership between the private sector and the federal government in finding energy solutions. This report is a product of AEIN.

## **ACKNOWLEDGMENTS**

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# Summary

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This report is a product of the American Energy Innovators Network (AEIN) and provides recommendations aimed at helping the Department of Energy better support small businesses engaged in energy-related innovation and technology transfer. Specifically, we focus on opportunities to strengthen DOE's implementation of the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. Both programs operate across multiple federal agencies and are intended to stimulate technology innovation and engagement in basic research and research and development (R/R&D) by domestic small businesses.<sup>1</sup> Note that our recommendations do not address SBIR/STTR implementation by the Advanced Research Projects Agency–Energy (ARPA–E), which runs a separate process. The recommendations in this report are based on literature surveys and feedback from experts within the small business community, including energy startups and venture capitalists who are part of AEIN.

Part I of this report reviews the goals and structure of DOE's SBIR/STTR program, and highlights some of the strengths and challenges of the Department's current approach to SBIR/STTR implementation. Part II focuses on opportunities for program improvement and reform at DOE, which includes five key recommendations:

- Align program staffing and management with SBIR/STTR goals.
- Bolster support for underrepresented and first-time applicants.
- Reform SBIR/STTR application processes.
- Align application review and selection criteria with all SBIR/STTR goals.
- Develop robust metrics of success and report results publicly.

Part III turns to recommendations for improving the SBIR/STTR program that would require legislative action by Congress. This section makes the case for three key reforms:

- Enable less restrictive SBIR/STTR topic areas.
- Allow flexibility for commercialization assistance.
- Remove eligibility restrictions.

# Part I: Introduction

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## BACKGROUND ON SBIR AND STTR

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The SBIR program dates back to the late 1970s, among rising concerns that the United States could lose its competitive edge in technology, combined with a recognition that small businesses play a critical role in innovation and job creation. Initially launched as an initiative of the National Science Foundation (NSF), SBIR was expanded and moved outside the NSF in 1982. A decade later, in 1992, Congress added the STTR program.<sup>2</sup> Both programs require federal agencies to set aside a portion of their budgets to operate highly competitive, awards-based programs aimed at (1) encouraging domestic small businesses to engage in basic research and development and (2) helping small businesses access federal funding, resources, and support for technology innovation and commercialization. SBIR and STTR operate under the oversight of the U.S. Small Business Administration but responsibility for implementation falls to individual agencies, which are directed to pursue several goals:<sup>3</sup>

- Stimulate technological innovation.
- Meet federal research and development needs.
- Foster and encourage participation in innovation and entrepreneurship by women and socially or economically disadvantaged persons.<sup>4</sup>
- Increase private-sector commercialization of innovations derived from federal research and development funding.
- Foster technology transfer through cooperative R&D between small businesses and research institutions (STTR only).

The STTR program differs from the SBIR program in that STTR requires small businesses to partner with nonprofit research institutions and focus on technology transfer from the research institution to the small business. By contrast, SBIR awards are given to small businesses directly. Currently, all federal agencies with R&D budgets above \$100 million are required to participate in SBIR; agencies with R&D budgets above \$1 billion are required to also participate in STTR.<sup>5</sup>

At more than \$350 million for fiscal year 2021 (including ARPA-E), DOE's budget for SBIR/STTR is the third largest among federal agencies (after the Departments of Defense and Health and Human Services, which each have annual SBIR/STTR budgets in excess of \$1 billion).<sup>6</sup> Like all federal agencies that implement these programs, DOE applies an explicitly phased structure to its SBIR and STTR grantmaking (Table 1). As noted in the Summary, the

recommendations in this paper focus on DOE’s SBIR/STTR programs—we do not address SBIR/STTR implementation by other federal agencies or by ARPA-E, which operates separately from DOE.

**Table 1: SBIR/STTR Program Phases<sup>7</sup>**

|                               | Phase 0  | Phase I  | Phase II   | Phase III   |
|-------------------------------|--|--|--|---|
| <b>Objective</b>              | Provide proposal assistance to first-time Phase I applicants (through Dawnbreaker <sup>8</sup> ) | Establish technical merit, feasibility, and commercial potential of proposed effort and assess a small businesses’ performance | Continue R&D from Phase I, with funding based on the results achieved during that time | Allow small businesses to pursue future commercialization objectives through alternative agency funding mechanisms (i.e., not the SBIR set-aside) |
| <b>Eligible Applicants</b>    | First-time Phase I applicants  | Small Business Concerns  | Phase I awardees   | Phase I/II awardees   |
| <b>Typical Award Amount</b>   | Not applicable   | \$50,000-\$250,000   | \$500,000-\$1,500,000  | Not applicable  |
| <b>Typical Award Duration</b> | Not applicable   | 6 months (SBIR) -12 months (STTR)  | Up to 2 years  | Not applicable  |

## STRENGTHS AND CHALLENGES

Because it has a large budget and invests solely in small businesses, DOE’s SBIR/STTR program has significant potential to transform the entrepreneurial landscape for clean energy technologies and help innovators access the networks and capital needed to transform their breakthrough ideas into successful companies.

Currently, the program is effective at:<sup>9,10</sup>

- Funding projects that contribute to DOE’s R&D needs,
- Diversifying the geographic reach of DOE R&D activities, and
- Processing and selecting applications in a timely manner (within 90 days between application deadline and award selection).

However, there is also room for improvement in several areas, including:<sup>11</sup>

- Attracting successful applications from woman-owned and minority-owned small businesses, as well as businesses in underrepresented states, by reforming current topic, reviewer, and selection processes that limit the diversity of SBIR/STTR participants;
- Attracting successful applications from businesses that are new to working with DOE; and
- Funding projects that are clearly tied to commercialization.

By reforming program organization and staffing, aligning program implementation with the full set of SBIR/STTR goals, and adopting practices that are better matched to the characteristics and needs of small startups, DOE can ensure that these programs achieve their full potential. The next sections detail our specific recommendations, starting with reforms that can be undertaken by DOE without further congressional action (Part II) before turning, in Part III, to additional changes that require new or amended legislation.

# Part II: Reform

## Recommendations For DOE

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### ALIGN PROGRAM STAFFING AND MANAGEMENT WITH SBIR/STTR GOALS

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Of the five congressionally mandated goals of SBIR and STTR, DOE's program is currently primarily focused on the goal of meeting federal R&D needs. A study by the National Academies of Science, Engineering, and Medicine (NASEM) found that other key goals—particularly the goals of increasing participation by underrepresented groups and improving commercialization outcomes—are not being well served by the current program setup.<sup>12</sup> This section outlines ways to reform SBIR/STTR organization, management, and staffing at DOE in ways that will help the Department better meet all program goals, including goals related to entrepreneurship, commercialization, and diversity.

#### **1. DOE should have dedicated SBIR/STTR program managers whose full-time job is to solicit, select, and manage SBIR/STTR projects.**

Currently, seven employees oversee DOE's SBIR/STTR program.<sup>13</sup> This relatively small staff coordinates with program managers across 13 DOE offices who have other primary responsibilities and who, in many cases, lack experience with small businesses and technology commercialization or transfer. As a result, the program suffers from insufficient oversight and an outsized focus on the technical merit of individual grant applications and their relevance to DOE office mission areas as compared to other SBIR/STTR goals. Additionally, most DOE program managers do not actively manage SBIR/STTR projects after they are selected, which can result in missed opportunities to maximize the impact of the program for its awardees.<sup>14</sup>

Instead of diffusing responsibility for SBIR/STTR implementation throughout the Department, DOE should hire dedicated program managers whose sole focus would be on administering the program and who would be housed within the DOE SBIR/STTR office. These managers should have private-sector and business expertise, together with the appropriate background knowledge needed to help small businesses succeed in commercializing their innovations. This model would allow program managers to be more actively involved with individual projects once projects have been selected for an award and would also allow for greater standardization of the approach and criteria DOE uses in selecting, reviewing, and managing SBIR/STTR awards. Other agencies including the

NSF follow this more centralized approach and have dedicated program managers for their SBIR/STTR program.

**2. Oversight of DOE's SBIR/STTR program should be moved from the Office of Science (SC) to the Office of Technology Transitions (OTT) and SBIR/STTR managers should report to the OTT director, who is also DOE's Chief Commercialization Officer.**

Currently, the SBIR/STTR program is housed under the DOE Office of Science (SC). As the DOE's scientific research office, the expertise and focus of SC are a mismatch with the goals of the SBIR/STTR program related to commercialization. Instead, OTT, as DOE's central office for commercialization and entrepreneurship programs, is a more suitable location for this program. OTT also is well-positioned to execute this program effectively given its reporting structure directly to the Secretary, which encompasses commercialization activities at the National Nuclear Security Administration and Office of Environmental Management, both of which participate in DOE's SBIR/STTR program.

**3. DOE's SBIR/STTR activities should be coordinated with other DOE entrepreneurship programs.**

DOE supports several programs to advance entrepreneurship and commercialization, including [Energy I-Corps](#), the [Energy Program for Innovation Clusters](#), and the [EnergyTech University Prize](#) (all housed under OTT), along with the [Lab-Embedded Entrepreneurship Program](#) and [American-Made Challenges Program](#), which are administered by the Office of Energy Efficiency and Renewable Energy (EERE). DOE should facilitate better coordination between SBIR/STTR and these related, existing programs to facilitate a pipeline of training and support for entrepreneurs in the energy space, especially those who would benefit most from government assistance to improve their odds of achieving commercial success.

**4. DOE should be flexible in its approach to SBIR/STTR grant management.**

The process of commercialization is inherently unpredictable and startups frequently have to alter their technologies to reflect changing market realities. This becomes problematic if DOE is too rigid in holding small businesses to the terms of their initial grant application. Instead, DOE should allow sufficient flexibility in its management of SBIR/STTR awards to ensure that small businesses can adjust course as needed in commercializing their technologies. For example, some other federal agencies, such as the Department of Defense (DOD), award fixed-price SBIR grants. This approach can dramatically reduce administrative burdens for Phase I awardees.<sup>15</sup>

DOE should also revise its grant process to minimize the burden on startups and small businesses, especially for applicants and grantees who may need additional support to properly identify and document grant activities.<sup>16</sup> The submission and documentation system DOE currently uses is outdated and opaque and it can be a struggle for many small startups to handle the massive documentation needed to successfully apply for and then comply with an SBIR/STTR grant. DOE needs to provide more guidance and services to awardees who do not have existing staff or structure to manage the administrative burdens that come with these grants. DOE should also adopt best practices from the NSF's SBIR/STTR Phase I Workshop for awardees to better communicate about grant management processes and expectations.<sup>17</sup>

**5. DOE's SBIR/STTR program should be staffed with experts from the private sector.**

Experience with startups and commercialization is needed to best serve SBIR/STTR program customers. In hiring for its SBIR/STTR program, DOE should include entrepreneurs, investors, and startup founders, while also striving for greater diversity in program staff to reflect the diversity of the applicant pool that DOE wishes to attract. DOE could also bring in this expertise through fellowships programs. Many members of DOE's current SBIR/STTR staff have mostly technical rather than commercial backgrounds, which can make it difficult to effectively serve program customers who are in the private sector.

**6. DOE should consider hiring a detail from the NSF's SBIR/STTR program to help the Department implement SBIR/STTR reforms.**

The NSF's SBIR/STTR program is often upheld as an example of a particularly well-run small business innovation program.<sup>18</sup> While not all aspects of the NSF model would necessarily be transferrable to other agencies, temporarily bringing in NSF staff to share best practices and lessons learned could be very helpful to DOE in implementing SBIR/STTR program reforms.

## **BOLSTER SUPPORT FOR UNDERREPRESENTED AND FIRST-TIME APPLICANTS**

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The percentage of DOE SBIR/STTR awards that goes to businesses owned by women or underrepresented groups is alarmingly low, given that increasing opportunities for these groups is an explicit goal of the program. In fact, from 2012 to 2020, there was no appreciable increase in the number of successful applications for DOE SBIR/STTR grants from businesses that are minority-owned, woman-owned, or from underrepresented states.<sup>19</sup> In 2017, just 5.1% of awards went to firms owned by individuals from socioeconomically

disadvantaged backgrounds and 10% of awards went to woman-owned firms.<sup>20</sup> Further compounding barriers to participation, many DOE program offices limit applications and outreach to new applicants due to bandwidth constraints.<sup>21</sup> This section outlines steps that DOE can take to attract more successful SBIR/STTR grant applications from woman-owned and minority-owned small businesses and better support first-time applicants.

## **7. DOE should offer direct outreach and services to SBIR/STTR applicants from underrepresented groups and first-time SBIR/STTR applicants.**

To address participation issues in DOE loan programs, the Energy Act of 2020 directed DOE's Loan Programs Office (LPO) to establish an Office of Outreach and Business Development that would be tasked with assisting the completion of loan applications, conducting conferences and online programs, and generally encouraging participation. DOE should consider establishing an office with similar goals and structure to better support applicants who wish to apply for SBIR/STTR funding, especially applicants who do not have prior experience applying for federal grants and who come from underrepresented backgrounds.<sup>22</sup> Such an office should be staffed by employees who have direct expertise and credentials related to diversity, equity, and inclusion.

The activities of such an office could include:

- Conducting strategic outreach, holding informational webinars, and providing examples of winning applications.
- Building out Phase 0 to focus more directly on funding applicants who come from underrepresented backgrounds.
- Developing a mentorship program or network of awardees where new or prospective applicants or Phase 0 applicants can meet with past DOE SBIR/STTR recipients to help in navigating application and award management processes.

DOE could also consider broadly sharing free video tutorials, similar to the tutorials that have been developed for Energy I-Corps, to guide potential applicants through the application and award management process as a form of asynchronous training.<sup>23</sup> While some of these resources exist, they are currently difficult to find and distributed over several webpages online. DOE should also consider collaborating with the Office of Economic Impact and Diversity to develop strategies for better supporting applicants and successful awardees from underrepresented backgrounds.

Lastly, the SBIR/STTR program should adopt best practices from responses to EERE's request for information on improving equity in climate innovation, in addition to findings in DOE's Equity Action Plan, to make meaningful progress on encouraging participation by women and underrepresented

individuals in entrepreneurship and small business ownership.<sup>24, 25</sup> The DOE Equity Action Plan takes a positive step by setting a goal of distributing a percentage of SBIR/STTR funds to women and minority-owned businesses roughly equal to that of these groups' representation in the overall small business population.<sup>26</sup> While this is a promising first step, DOE should take this further and aim to actually increase the overall share of U.S. small businesses led by women and underrepresented individuals to reflect that of the overall share of the U.S. population, which would better fulfill the spirit of the SBIR/STTR program goals.

**8. DOE SBIR/STTR program managers should provide feedback to unsuccessful applicants.**

Unsuccessful applicants should receive feedback from program managers on why applications were not selected for funding. This will help less experienced applicants submit more competitive applications in the future and provide more transparency into the review and selection process. Applicants currently receive feedback from reviewers but do not receive feedback from program managers at DOE.

**9. DOE SBIR/STTR should focus on funding new companies.**

Many of DOE's SBIR/STTR grants go to companies that have won repeated awards and are less focused on commercializing new projects than they are on growing and sustaining company operations.<sup>27</sup> A DOE-funded study found that firms that had previously received SBIR awards from DOE's Office of Energy Efficiency and Renewable Energy (EERE) were half as likely to acquire subsequent venture capital funding compared to firms that had received no prior SBIR funding.<sup>28</sup> Like the NSF SBIR/STTR program, DOE should prioritize providing awards to new companies that have received limited prior SBIR/STTR funding. This would help ensure that the funds are used to commercialize new technologies rather than to subsidize the research functions of established companies.

Additionally, many potential applicants to DOE's SBIR/STTR program are uncertain whether they can qualify for funding if they are venture-backed. DOE should clarify eligibility for such companies and moreover, should encourage them to apply. DOE should also relax limits on the amount of venture capital funding applicants are allowed to have.<sup>29</sup>

## REFORM SBIR/STTR APPLICATION PROCESSES

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DOE's current model for SBIR/STTR grantmaking is burdensome for startups, with processes, deadlines, and topic areas that are a direct mismatch with the flexibility needed to effectively support the fast-paced small business community. This section provides recommendations for reforming SBIR/STTR procedures to better meet small business needs.

### **10. DOE should make the application process for SBIR/STTR grants less burdensome and friendlier to startups.**

In recent years, the NSF reformed its SBIR/STTR application process, in part by establishing a pre-application phase where applicants make a short project pitch, which mirrors how entrepreneurs communicate in the business world.<sup>30</sup> DOE could consider adopting a similar approach to screen potential applicants, in addition to simplifying the process for applying for SBIR/STTR funds. While the letter-of-intent (LOI) approach DOE currently uses is intended to reduce barriers to applying, the LOI remains too focused on technical merit. Allowing entrepreneurs to make a shorter project pitch could be especially impactful in terms of encouraging applicants from underrepresented backgrounds.

### **11. DOE should improve communication and accessibility in its SBIR/STTR materials.**

The current communication style in DOE's SBIR/STTR program is highly academic—thus, many program materials do not speak the language of entrepreneurs, startups, and small businesses. Potential applicants also complain about a program website that is difficult to navigate, confusing instructions in funding opportunity announcements (FOAs), and a lack of transparency around program impacts and successes.<sup>31</sup> While information about application checklists, sample commercialization plans, and reporting requirements is available, these resources are distributed over multiple websites (one count included at least four separate websites related to the program) and buried in long paragraphs of superfluous information.<sup>32</sup>

In contrast, the NSF's SBIR/STTR program is much more accessible with an easy-to-navigate website, clear instructions, and straightforward communication about successes through write-ups that highlight program impacts.<sup>33</sup> DOE should revamp the content and communication style of its program materials to make them more accessible to the startups and small businesses that SBIR/STTR is meant to serve.

### **12. DOE should reconsider SBIR/STTR application deadlines.**

DOE should consider allowing at least two cycles of applications each year for a given topic to allow unsuccessful applicants a second chance

at competing for SBIR/STTR funds. This approach would align well with DOE's existing pattern of having two SBIR/STTR releases annually. DOE should also consider changing some current deadlines that fall after major U.S. holidays.<sup>34</sup> Another option would be to adopt the NSF's approach of accepting and reviewing applications on a rolling basis. This would allow entrepreneurs to apply for funding when they are ready rather than waiting up to a year for SBIR/STTR deadlines to arrive.<sup>35</sup>

**13. DOE should solicit SBIR/STTR applications under broad topic areas rather than limiting applications to narrowly defined topics that reflect highly specific federal R&D goals.**

Due to restrictions imposed by the congressional appropriations process, SBIR/STTR applications must be solicited through a series of subaccounts at the level of individual DOE program offices. Removing these restrictions would require congressional action (see recommendation 19), but DOE could still define the SBIR/STTR topics chosen under these subaccounts more broadly. This would avoid disqualifying entrepreneurs whose innovations might be highly relevant to DOE's mission but fall outside the defined scope of selected topics. The current approach reflects an outsized focus on meeting federal R&D goals.<sup>36</sup>

As an example, the list of DOE [SBIR/STTR solicitations for 2021](#) includes topics such as: "Correlate Log Data and or Host Sensor Data with Network Trace Data" (under the Advanced Scientific Computing Research subaccount within the Office of Science); Development of Damage-free and "Strain-free Processing and Mounting of Ultra-thin Diamond Crystal Plates" (under the Basic Energy Sciences subaccount within the Office of Science); and "Next-Generation Power Electronics based on Silicon Carbide and/or Planar Magnetics" (under the Solar Energy Technologies Office subaccount within the Office of Energy Efficiency and Renewable Energy). Each of these solicitations could be broadened in a way that still reflects the mission of the sponsoring program/subaccount and of the DOE office it is under. Some offices, such as the Vehicle Technologies Office within EERE and the Office of Fossil Energy and Carbon Management have solicited applications under topics that are appropriately broad but still relevant to office mission areas, such as "Electric Drive Vehicle Batteries" and "Conversion of CO<sub>2</sub> into Plastics."

## **ALIGN APPLICATION REVIEW AND SELECTION CRITERIA WITH ALL SBIR/STTR GOALS**

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DOE's current SBIR/STTR review criteria and selection processes weigh technical merit and relevance to federal R&D needs more heavily than other SBIR/STTR program goals. The recommendations in this section aim to ensure that DOE implements SBIR/STTR in a way that reflects all the program's goals.

**14. Criteria for evaluating SBIR/STTR applications should be comprehensive in the sense that they reflect all the goals of the SBIR/STTR program.**

Currently, DOE program managers often judge SBIR/STTR applications primarily on the basis of their ability to advance federal R&D objectives, which is just one of five goals of the program.<sup>37</sup> New merit review criteria should reflect all the stated goals of SBIR/STTR, including by assessing the commercialization potential of proposals and encouraging participation from underrepresented entrepreneurs.

**15. DOE program managers should solicit SBIR/STTR reviewers with a diversity of expertise.**

Merit reviewers for SBIR/STTR applications should reflect a diversity of subject matter expertise. In the past, DOE has primarily solicited reviewers from academia, which misses the opportunity to incorporate expertise from the private sector—currently, only 10% of SBIR/STTR reviewers have a private-sector background, with the remainder coming from academia and government.<sup>38,39</sup> Reviewers with entrepreneurial and/or private-sector experience are particularly needed to evaluate the technology and commercialization plan components of SBIR/STTR applications, as well as reviewers with experience in diversity, equity, and inclusion who understand the particular challenges faced by entrepreneurs from underrepresented backgrounds. To develop a broad database of reviewers, DOE could consider creating a simple webpage where interested individuals can register their interest and share their background and expertise, similar to EERE’s reviewer registration system.<sup>40</sup>

**16. DOE should solicit SBIR/STTR reviewers with diverse demographic characteristics and should compensate them for their time.**

Given that a goal of the SBIR/STTR program is to encourage participation by underrepresented entrepreneurs, DOE should solicit reviewers who reflect the applicant pool DOE wishes to serve.<sup>41</sup> Further, since highly qualified reviewers will tend to be people who already have many demands on their time, DOE should pay them for their services to the program—currently some DOE offices follow this practice, but not all.<sup>42</sup>

To recruit reviewers from diverse backgrounds, DOE should also consider targeted outreach to Historically Black Colleges and Universities and other Minority-Serving Institutions, as well as professional societies associated with underrepresented groups in industry and venture capital. This can help bring more individuals into DOE’s network who do not normally engage with the agency and help these individuals understand what is involved in successfully receiving an SBIR/STTR award, laying the groundwork for them to potentially apply for an award in the future.<sup>43</sup>

## **DEVELOP ROBUST METRICS OF SUCCESS AND REPORT RESULTS PUBLICLY**

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Currently, the metrics reported by the SBIR/STTR program focus on the efficiency with which awards are selected and whether agency spending requirements are being met. Metrics related to achieving other program goals, particularly with respect to commercialization, are underreported.<sup>44</sup> This section presents recommendations to improve metrics and reporting.

### **17. DOE should publicly report data on the diversity of SBIR/STTR grant applicants and recipients.**

This data should be reported on an annual basis for all categories of applicants and recipients, showing long-term trends relating to the diversity of the applicants who apply for and receive awards in the categories recognized by the U.S. Small Business Administration, at a minimum. In line with the broader requirements of [Executive Order 13985](#), DOE should also provide data on metrics relating to gender, race, and other relevant criteria. Moreover, developing and reporting information at the intersection of multiple criteria (e.g. criteria that reflects multiple categories simultaneously such as Black women, AAPI men, etc.) will allow for a more accurate and nuanced understanding of the demographics of SBIR/STTR applicants and recipients.<sup>45</sup>

### **18. DOE should develop and publicly report SBIR/STTR metrics related to technology commercialization.**

One of the stated goals of the SBIR/STTR program is to foster successful private-sector commercialization of innovations derived from federal R&D investments. However, DOE does not collect or report any metrics related to commercialization at present. DOE should develop relevant metrics to measure commercialization outcomes and publicly publish this data on an annual basis to demonstrate the impact of its SBIR/STTR program on commercialization. Examples of the kinds of metrics DOE could use to track and report commercialization outcomes could include follow-on funding from the private sector, number of companies formed, and employment growth. Metrics can be flexible and tailored for individual awardees, and they can take different forms depending on the stage of development and size of the company, as well as the end-goal of the award the company receives. Metrics and criteria for success should be decided on a case-by-case basis.

# Part III: Reform

## Recommendations that Require Legislative Changes

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As SBIR approaches its 40th anniversary, Congress has an opportunity to revitalize this historically excellent program in a way that reflects the present-day needs and realities of the small business community and further improves program performance. In addition to the legislative recommendations in this section, Congress can also ensure success of this program through stricter oversight of the reform recommendations in Part II of this report. This section discusses reform recommendations that would require legislative changes to the SBIR and STTR programs.

### **19. Congress should authorize DOE to solicit SBIR/STTR applications under broad topic areas.**

Due to restrictions in the DOE appropriations process, SBIR/STTR applications must currently be solicited through subaccounts within the budget of individual DOE offices.<sup>46</sup> This not only results in overly restrictive topic areas for SBIR/STTR applications, it also has practical drawbacks for program implementation. For example, due to the small minimum required percentage of STTR annual allocations (0.45%), some DOE subaccounts must wait multiple years to accumulate enough money to fund a single STTR award. Congress should allow SBIR/STTR awards to be issued at the program office level (e.g., Office of Science, Office of Energy Efficiency and Renewable Energy, etc.) rather than at subaccount level (e.g., Basic Energy Sciences, Solar Energy Technologies Office, Vehicle Technology Office, etc.) to allow DOE more flexibility in choosing topic areas and increase participation in the SBIR/STTR program. This reform recommendation is not addressed in current legislative proposals. Proposed legislative language to address this reform is provided in Reference 47.<sup>47</sup>

### **20. Congress should remove the requirement that SBIR/STTR-funded commercialization assistance be obtained only through external vendors.**

Existing statute allows a small percentage of SBIR/STTR funds to be used for commercialization assistance. However, any assistance of this type must be delivered by an external vendor if it is supported by SBIR/STTR funds. Allowing companies to use SBIR/STTR funds for in-house commercialization activities would enable them to develop internal capacity related to marketing and business development that will be essential for their long-

term success. Congress should also increase the amount of funding that can be used for commercialization assistance. This recommendation is included in recently proposed, bipartisan legislation: [S.3109/H.R.652 the Research Advancing to Market Production for Innovators Act](#).

**21. Congress should remove the restriction that limits SBIR/STTR Phase II award eligibility to previous Phase I award winners.**

Small businesses should be able to apply directly for a Phase II award if they already meet Phase I standards. Restricting Phase II applications to prior Phase I awardees unnecessarily limits eligible small businesses. This change has already been implemented at other agencies, including the Department of Defense, the Department of Education, and the National Institutes for Health, and should be extended to DOE. This reform recommendation is included in recently proposed, bipartisan legislation: [H.R. 4033 the Small Business Innovation Research and Small Business Technology Transfer Improvements Act of 2021](#).

# Conclusion

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Energy is at the heart of some of the most difficult and consequential challenges America confronts this century—from mitigating climate change to promoting continued prosperity, improved national security, economic competitiveness, and technological leadership in the 21st century. These challenges cannot be met without harnessing the entrepreneurial spirit and innovative capacities of America’s small businesses and small-business owners. For 40 years, SBIR, and later STTR, have provided a unique tool for engaging the substantial resources of the federal government in helping small businesses bring cutting-edge inventions to market that they otherwise may not have the resources to advance. As the leading federal agency on energy R&D and energy technology development, DOE has an enormous opportunity—through improved implementation of SBIR and STTR—to cultivate a more capable and diverse community of small business energy entrepreneurs and thereby help ensure that clean, secure, and affordable energy solutions are ready when our nation, and the world, needs them.

# References and Notes

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- 1 More information about SBIR and STTR is available at: <https://www.sbir.gov/tutorials/program-basics/tutorial-5#>. A 2021 BPC report also provides an overview of both programs, available at: <https://bipartisanpolicy.org/report/turbocharging-small-business/>.
- 2 Bipartisan Policy Center, *Turbocharging Small Business Innovation*, pg. 5, March 2021. Available at: <https://bipartisanpolicy.org/report/turbocharging-small-business/>.
- 3 Small Business Administration, *SBIR STTR: America's Seed Fund: Mission*. Available at: <https://www.SBIR.gov/about>.
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“GENERAL PROVISIONS—DEPARTMENT OF ENERGY.

Sec. 301.

*(h) EXCLUSIONS.—Subsections (d), (e), and (f) shall not apply to applied energy program funds transferred or reprogrammed under —*

*(1) the small business innovation research program under section 9 of the Small Business Act (15 U.S.C 638); or*

*(2) the small business technology transfer program under that section.”*



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