



TUTORIAL 2

How to Find the Right Topic

DETERMINING THE RIGHT CATEGORY

When the Department of Energy or DOE releases its Topics document, it is important that you spend considerable time reviewing the topics and subtopics to find the opportunity that you can best address. It is also important to remember that the opportunity that you select is really a Topic/subtopic pair – in that your proposal must address the guidelines provided for the Topic and the subtopic that you select. Looking for the right topic requires two things: (1) an understanding of your core competencies; and (2) an understanding of where the Department of Energy’s topics come from. Looking for the right topic is a matching task – one in which you assess if your core competencies can help the DOE address its needs. However, before exploring if there is a match – there are a few fundamental points that you must understand.

The Small Business Innovation Research (SBIR) and the Small Business Technology Transfer (STTR) programs do NOT fund research that has already been accomplished. In other words, if you have already developed a product and are looking to fund a demonstration – this is NOT the appropriate venue.

Another point to keep in mind is that if you are myopic and ONLY have an interest in securing funding for a research initiative that you have already mapped out – this is also NOT the right avenue. To be successful in utilizing the SBIR or STTR programs, you must be willing to examine and understand what the DOE needs and then determine if there is a match between DOE’s needs and your core competencies. Without an interest in both, you cannot be successful.

CORE COMPETENCIES

When talking about “your” core competencies – we are referring to specialized skills that either you or your company have that will enable you to implement a research and development plan in response to a DOE topic. One assumption that you should make is that to be successful in the SBIR and STTR programs, the proposing team must have research skills acquired either through formal training or through experience.

<i>Program's Name</i> →	PROGRAM AREA OVERVIEW: OFFICE OF SCIENCE 10
	1. TECHNOLOGIES FOR MANAGING AND ANALYZING COMPLEX DATA IN SCIENCE AND ENGINEERING 10
	a. Complex Data 11
	PROGRAM AREA OVERVIEW: OFFICE OF ADVANCED SCIENTIFIC COMPUTING RESEARCH..... 17
	2. HPC CODE AND SOFTWARE TOOLS 18
	a. Hardening of R&D Code or Software Tools..... 18
	b. Other 18
	3. HPC CYBERSECURITY 18
	a. Cybersecurity Technologies 19
	b. Other 19
	4. INCREASING ADOPTION OF HPC..... 20
	a. Turnkey HPC Solutions 20
	b. Enhancements to Support HPC-driven Data Analytic Workflows 21
	c. Other 21
<i>Topic</i> →	5. TECHNOLOGIES FOR SHARING NETWORK PERFORMANCE DATA 22
	a. Anonymization Tools and Services 22
	b. Correlate Log Data and or Host Sensor Data with Network Trace Data 23
	c. Other 23
	6. EMERGING NETWORK TECHNOLOGIES 24
	a. Transparent Optical Quantum Network Devices 24
	b. Embedded Software-Defined (SDN) Controller for Quantum Networks and Intelligent Internet of Things (IoT) 25
	c. Other 25
	7. TECHNOLOGIES FOR EXTREME-SCALE COMPUTING 26
<i>Subtopic</i> →	a. Algorithms for Scientific Applications 27
	b. Software Technologies 27
	c. Other 27
	8. TECHNOLOGY TO FACILITATE THE USE OF NEAR-TERM QUANTUM COMPUTING HARDWARE 28
	a. Ultra-low Vibration, Ultra-high Vacuum Cryostat for Trapped Ions 28
	b. Software for Calibration, Characterization, and Control of Quantum Processors 29
	PROGRAM AREA OVERVIEW: OFFICE OF BASIC ENERGY SCIENCES 30

Exhibit 1: DOE's topic release example

DOE PROGRAM OFFICES

Let's begin to explore the DOE's topics. The DOE releases topics twice a year, once in July, and again in November. The first topic release typically involves four participating DOE Research Programs:

- » Office of Advanced Scientific Computing Research
- » Office of Basic Energy Sciences
- » Office of Biological and Environmental Research
- » Office of Nuclear Physics

The second topic release is in November. It is usually larger than the first release and contains topics from a different and larger set of DOE Research Programs. They are listed in the pdf so that you can see the diversity of research programs that usually participate in the second release.

Second Topic Release

- Office of Cybersecurity, Energy Security, and Emergency Response
- Office of Defense Nuclear Nonproliferation
- Office of Electricity
- Office of Energy Efficiency and Renewable Energy
- Office of Environmental Management
- Office of Fossil Energy
- Office of Fusion Energy Sciences
- Office of High Energy Physics
- **Office of Nuclear Energy**

Figure 1: List of DOE's second topic release



Understanding that the topics are different in the two releases, you will want to review either the first or second topic release depending upon your research interests. Each topic release is structured in the same way. This is most easily understood by taking a look at the table of contents within the Topics document itself. The table of contents is organized alphabetically by the DOE research program's name. Underneath each DOE office is a list of topics in bold, with a series of subtopics in regular type font underneath. By scanning the table of contents, you can quickly get a feeling for the type of research that DOE funds and begin to assess if these research areas match with your core competencies.

HOW TOPICS ORIGINATE

Let's examine where the DOE topics come from, starting with the agency's mission. DOE's mission is to "Ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions." Each year, the DOE prepares and submits a budget to Congress to fund initiatives consistent with its mission. Part of the budget is for research and development conducted by numerous entities including federal laboratories, universities, large industrial firms, and small business. Each of the Offices mentioned in the topics document is responsible for fulfilling part of DOE's overall mission as it relates to their area of expertise. SBIR and STTR topics are in essence an extension of the method that DOE uses to fulfill its research mission. When you respond to a DOE SBIR or STTR topic, you are addressing a national need.

Let's now return to the question of matching your core competencies with DOE's needs. To do this, you must start by being reflective and identifying your company's unique strengths. Let's assume that you are a materials engineer just starting a new company. You have an interest in high temperature materials and new manufacturing processes. How would you go about finding a good topic? Perhaps the best way to start is by reading the table of contents in the Topics document and using the hyperlinks to jump to those sections that look interesting. As you find good topics, highlight those of interest, so you can easily find them again. Another way to ferret out potential topics is to conduct a key word search using relevant terms such as "high temperature", or "manufacturing". If you find that you don't get many hits using this strategy, then expand your search terms.

As you find topics and subtopics that look interesting, consider if you and/or your team have the skill set that could address the problems identified in the topics of interest. Remember, that when you prepare a proposal to the Department of Energy's SBIR/STTR programs, you must respond to BOTH a topic and a subtopic. When you find an opportunity that seems to fit – make sure that you review all of the guidance provided in the topic and subtopic thoroughly. If you determine that you lack some essential core competencies, consider adding a subcontractor or consultant to your team – but be sure to start looking for other team members very early in the process. In subsequent tutorials we will explore how to find team members.

FOR MORE INFORMATION, PLEASE CONTACT

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