REQUEST FOR INFORMATION

Office of Technology Transitions
U.S. Department of Energy

ISSUE DATE: November 26, 2018

CLOSING DATE: January 11, 2019

SUBJECT: Request for Information – Technology Commercialization Fund

DESCRIPTION: The U.S. Department of Energy (DOE) seeks feedback from public and private sector stakeholders regarding opportunities to enhance the commercial impact of DOE's portfolio of Research, Development, Demonstration & Deployment activities.

BACKGROUND: The Department of Energy's (DOE's) contributions to U.S. economic growth involve many different types of transitions in the stages of technical capability, technology development, identification of public need, and development of market acceptance. To provide the necessary central definition of vision, goals, and accountability management in these multiple activities, the Secretary of Energy established the Office of Technology Transitions (OTT) in February 2015.[1]

OTT's mission is to expand the commercial impact of DOE's research and development portfolio to advance the economic, energy, and national security interests of the nation. To accomplish this mission, OTT provides technology transfer leadership and coordination responsibilities assigned to the Technology Transfer Coordinator in the Energy Policy Act of 2005 (EPAct 2005), and coordinates DOE-wide activities to transition technologies through the innovation cycle to maximize the impact of DOE's investments. Along with other commercialization programs, OTT is responsible for the Technology Commercialization Fund (TCF), which was statutorily created in EPAct 2005. The approximately $25 million annual fund was created "to provide matching funds with private partners to promote promising energy technologies for commercial purposes." Since 2016, DOE has invested more than $57 million and leveraged more than $81 million in private industry matching funds, for a total of approximately $138 million toward TCF commercialization projects (Figure 1-1).

[1] U.S. Department of Energy. "Energy Department Announces New Office of Technology Transitions." Press Release. February 11, 2015. http://energy.gov/articles/energy-department-announces-new-office-technology-transitions

Figure 1-1

DOE Program Office	FY16-18 TCF Projects Selected	TCF Funding Requested	Non-Federal Matching Funds	Proposed Total Budget
Office of Energy Efficiency and Renewable Energy (EE)	93	$30,000,000+	$35,000,000+	$65,000,000+
Office of Fossil Energy (FE)	33	10,000,000+	$24,000,000+	$35,000,000+
Office of Nuclear Energy (NE)	35	12,000,000+	$13,000,000+	$25,000,000+
Office of Electricity (OE)	11	$3,500,00+	$3,500,000+	$7,000,000+
Total	**172**	**55,00,000+**	**$80,000,000+**	**$135,000,000+**

PURPOSE: The purpose of this Request for Information (RFI) is to seek input about how OTT might improve the TCF through changes to the program and its structure. OTT seeks specific input on key areas of interest, which are outlined below. The outlined topics and questions are intended to guide, but not restrict, the scope of RFI responses.

This RFI builds on previous DOE RFIs related to technology transfer and commercialization topics, including the 2008 Federal Register Notice on DOE Technology Transfer Practices,[2] the 2013 Office of Energy Efficiency and Renewable Energy (EERE) Commercialization RFI,[3] and OTT's 2015 RFI,[4] which included a section about the TCF. Responses to this RFI will serve as a complement to the input collected from these previous requests; however, respondents are encouraged to submit any relevant information to this RFI, even if it appeared in a previous response.

DISCLAIMER AND IMPORTANT NOTES: This RFI is not a Funding Opportunity Announcement (FOA); therefore, DOE is not accepting applications at this time. DOE may issue a FOA in the future based on or related to the content and responses to this RFI. There is no guarantee that a FOA will be issued as a result of this RFI. Responding to this RFI does not provide any advantage or disadvantage to potential applicants if DOE chooses to issue a FOA regarding the subject matter. This is also not a solicitation for a federal procurement contract. In accordance with the Federal Acquisition Regulation, 48 C.F.R. 15.201(e), responses to this notice are not offers and cannot be accepted by the Government to form a binding contract. DOE will not provide reimbursement for costs incurred in responding to this RFI. Respondents are advised that DOE is under no obligation to acknowledge receipt of the information received or

[2] U.S. Department of Energy. "Questions Concerning Technology Transfer Practices at DOE Laboratories." 73 FR 72036, Doc No. E8-28187. November 26, 2008. https://www.federalregister.gov/articles/2008/11/26/E8-28187/questions-concerning-technology-transfer-practices-at-doe-laboratories

[3] U.S. Department of Energy. "Request for Information - EERE Commercialization." DE-FOA-0001001. September 2013. http://www.grants.gov/web/grants/view-opportunity.html?oppId=243333

[4] U.S. Department of Energy. "Request for Information – Office of Technology Transitions" DE-FOA-0001346. May 2015. https://www.energy.gov/technologytransitions/downloads/de-foa-0001346-request-information-rfi

provide feedback to respondents with respect to any information submitted under this RFI. Responses to this RFI do not bind DOE to any further actions related to this topic.

Any information obtained as a result of this RFI is intended to be used by the Government on a non-attribution basis for planning and strategy development; this RFI does not constitute a formal solicitation for proposals or abstracts. Your response to this notice will be treated as information only. DOE will review and consider all responses in its formulation of program strategies for the identified materials of interest that are the subject of this request.

PROPRIETARY INFORMATION: Because information received in response to this RFI may be used to structure future programs and FOAs and/or otherwise be made public, **respondents must NOT include any information in their responses that might be considered business sensitive, proprietary, or otherwise confidential.** Responses must be submitted with the understanding that their contents may be publicly disclosed and, in the event of a public disclosure, DOE will NOT notify respondents or provide any opportunity to revise or redact submitted information.

EVALUATION AND ADMINISTRATION BY FEDERAL AND NON-FEDERAL PERSONNEL: Submissions may be reviewed by federal and non-federal personnel, e.g., support contractors, private consultants, and other qualified non-Federal personnel. The Government may also use non-federal personnel to conduct routine, nondiscretionary administrative activities. The respondents, by submitting their response, consent to DOE providing their response to federal and non-federal parties. DOE will require that non-federal parties given access to responses will be subject to an appropriate obligation of confidentiality prior to being given such access. Federal employees, however, will not be required to sign non-disclosure agreements because federal employees are subject to the non-disclosure requirements of a criminal statute, the Trade Secrets Act, 18 USC 1905.

RESPONSE GUIDELINES: All responses to this RFI must be submitted electronically to TCFRFI@hq.doe.gov with the subject line "TCF RFI Response" no later than **January 11, 2019**. **All responses must be submitted as a Microsoft Word document (.doc/.docx) of no more than 5 pages in length, with black, Times New Roman, 12 point font, and 1 inch margins as an attachment to an email. The document can not exceed 2MB in size.** Only electronic responses will be accepted. DOE will not consider responses submitted by any other means.

Respondents are requested to provide the following information at the start of their response to this RFI:

- Company / institution name;
- Company / institution contact;
- Contact's address, phone number, and email address.

Please identify your answers by responding to a specific question or topic if possible. Respondents may answer as many or as few questions as they wish. Any additional comments that are not responsive to a particular question should be set out separately at the end of your response to this RFI as "Additional Comments." DOE will not respond to individual submissions or publish a compendium of responses. **TOPICS AND QUESTIONS FOR INPUT:**

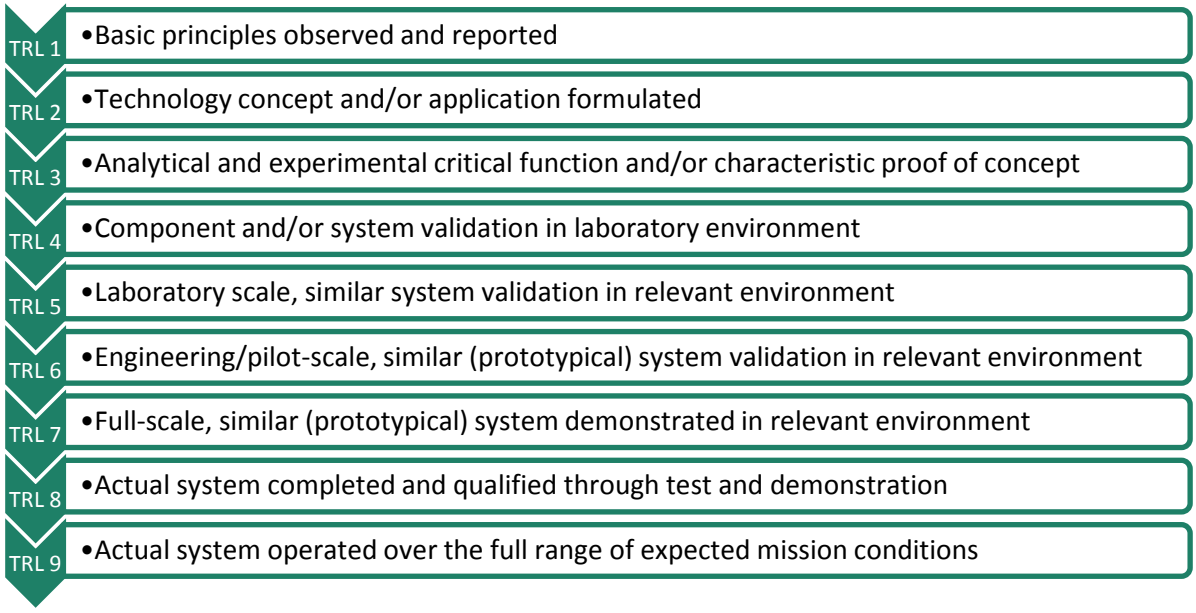
Technology Commercialization Fund

Background:

DOE's enterprise of National Laboratories, Plants, and Sites (hereinafter referred to as DOE Facilities) has a more than 70-year history of delivering world-class science and technology solutions to pressing national issues. DOE Facilities are proven partners in collaborative R&D projects that provide the foundational science and technology for the private sector to then derive new products and processes in myriad industries. DOE's annual multibillion-dollar investment in research at DOE Facilities results in the invention and development of novel technologies and other forms of intellectual property (IP). DOE Facilities have developed partnerships with private parties to pursue commercial applications of these technologies. To date, there have been thousands of licenses between DOE Facilities and private partners. Nevertheless, an even larger reservoir of IP has not transitioned to the private sector because a technology may not be mature enough to attract a partner—or industry may not fully understand its market potential.

DOE's Facilities consistently possess a lack of resources to develop technologies to a stage that attracts private sector interest. In many cases, public funding—from DOE or other sources—supports R&D activities up to an early Technology Readiness Level (TRL), which communicates where in the commercialization process a technology is relative to a specific application (Figure 1-2). But such funding is cut off before the technology matures to a point that a business will enter into a cooperative R&D agreement or seek to license the technology.

Figure 1-2: Technology Readiness Levels



Department of Energy (DOE). 2011. *Technology Readiness Assessment Guide.* DOE G 413.3-4.

A 2013 report commissioned by the White House Office of Science and Technology Policy concluded that "[m]any promising early-stage technologies developed at Department of Energy

[N]ational [L]aboratories require 'maturation' in the form of additional development, testing, or prototyping before companies are willing to invest in them for commercial purposes."[5]

Section 1001 of the EPAct 2005, as amended, established an Energy Technology Commercialization Fund (TCF) (42 U.S. Code § 16391(e)),[6] as follows:[7]

> (e) TECHNOLOGY COMMERCIALIZATION FUND. – The Secretary shall establish an Energy Technology Commercialization Fund, using 0.9 percent of the amount made available to the Department for applied energy research, development, demonstration, and commercial application for each fiscal year based on future planned activities and the amount of the appropriations for the fiscal year, to be used to provide matching funds with private partners to promote promising energy technologies for commercial purposes.

Until 2016, DOE complied with Section 1001 by accounting for relevant activity that was already completed by DOE's applied energy program offices. These program office activities met the legislative mandate because DOE funds involved were matched by a combination of direct funding and in-kind contributions from a private partner.[8] However, the National Defense Authorization Act for fiscal year (FY) 2015 included an amendment clarifying that the Department should base the TCF on "future planned activities."

OTT developed a forward-looking approach to implement the TCF, leveraging 0.9% of the RDD&D funding from DOE's participating applied energy programs to pursue high impact technology commercialization activities.

DOE's applied energy Program Offices that participate in the TCF are:

- Office of Cybersecurity, Energy, Security, and Emergency Response (CESER)
- Office of Electricity (OE)
- Office of Energy Efficiency and Renewable Energy (EE)
- Office of Fossil Energy (FE)
- Office of Nuclear Energy (NE)

CESER was created in 2018 so it has not participated in the TCF to date, but it will starting in FY19. The TCF is part of a broad array of activities that DOE and its Facilities undertake to ensure Federal research and development (R&D) investments in technology with commercial potential find their way to a viable market. The TCF Federal funds are matched with non-Federal contributions to:

- Perform technology maturation with the intent of attracting a private partner that is willing to support the technology's commercialization.
- Support cooperative development of technology with a private partner for a specific commercial application.

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[5] IDA Science and Technology Policy Institute. "Department of Energy Technology Maturation Programs." May 2013. Available online at: https://www.ida.org/~/media/Corporate/Files/Publications/STPIPubs/ida-p-5013.ashx (accessed December 8, 2017).
[6] P.L. 113-291, SEC. 3144. TECHNOLOGY COMMERCIALIZATION FUND. Section 1001(e) of the Energy Policy Act of 2005 (42 U.S.C. 16391(e)) is amended by inserting ''based on future planned activities and the amount of the appropriations for the fiscal year'' after ''fiscal year''.
[7] Updated statute based on amendment by the National Defense Authorization Act for Fiscal Year 2015.
[8] EERE temporarily established a proactive, EERE-level Technology Commercialization Fund in FY 2007 and FY 2008.

DOE established the infrastructure and processes for the TCF, which it launched as an annual solicitation to DOE Facilities for projects in FY 2016. OTT made incremental programmatic and process changes for the FY 2017, 2018 and 2019 cycles.

Summary of the FY 2019 Technology Commercialization Fund

Eligible applicants are DOE Facilities as defined previously. No other entities, public or private, are eligible for award. Applicants are eligible for multiple awards. Multiple DOE Facilities may partner together on a single application.

All projects proposed for funding must demonstrate mission area relevance to one or two of DOE Program Office Technology Areas identified in the TCF Solicitation. It is incumbent on applicants to identify and select the correct Program Office(s) and Technology Area(s). DOE Facilities may submit proposals with cross-programmatic application or benefit. As an example, a wind farm load forecasting model could be applicable to the Wind Energy Technology Area within the Office of Energy Efficiency and Renewable Energy, as well as to the Transmission Reliability and Resistance Technology Area within the Office of Electricity.

Proposals must pursue one of the following two Topic Areas:

- Topic 1 Technology Maturation
  These projects focus on DOE Facility-developed technologies that have commercial promise, have reached a TRL of at least three (Figure 1-2), and have the potential to attract a private partner. Topic 1 projects may—but are not required to—involve a partner. The target TCF funding for each Topic 1 award is $100,000-$150,000. The target period of performance for a Topic 1 award is 6-12 months.

- Topic 2 Cooperative Development
  These projects focus on technologies for which DOE Facilities already identified a commercial partner willing to execute a partnership agreement. A Cooperative Research and Development Agreement (CRADA) is the default agreement. A CRADA is a collaborative agreement that allows the Federal Government and non-federal partners to share technical expertise in a protected environment, access intellectual property emerging from the effort, and advance the commercialization of federally developed technologies. While a CRADA is the default agreement type, other agreements may be used in lieu of a CRADA with advanced approval. This Topic supports cooperative development with a private partner of a commercial application for technology developed at DOE Facilities. Applicants will have already undertaken some form of evaluation to determine if the technology is viable for commercialization—such as IP mapping, participation in the Energy I-Corps program, or other activities. The target TCF funding for each Topic 2 award is $250,000-$750,000. The target period of performance for a Topic 2 award is 12-24 months.

Non-Federal entities, including private companies, state or local governments—or entities created by a state or local government—universities, or non-profit organizations are eligible partners. Partners must agree to engage in activities that focus on commercializing or deploying technologies in the marketplace. TCF projects that involve partners are expected to use a

CRADA as the partnering mechanism, although alternate agreement types may be used with prior approval.

All projects require matching funds of at least 50% of the total project cost, which must come from non-Federally-appropriated funds. If a DOE Facility provides the matching funds, they must give a cash contribution. If a private partner provides the matching funding, they can give a cash or in-kind contribution. DOE's funding amounts, $100,000-$150,000 for Topic 1 and $250,000-$750,000 for Topic 2, were formulated using DOE staff expertise and internal stakeholder discussions.

If a technology receives funding as a Topic 1 project, it may be eligible to receive funding as a Topic 2 project, provided the following conditions are met: the project is complete and was successful in accomplishing the project's goals; the project complied with all reporting requirements; and the new funding request meets the Solicitation's requirements and advances the technology toward commercialization.

Information Request:

OTT seeks information that could inform the re-design and implementation of the TCF, including, but not limited to, the following questions:

TCF Program Structure & Process

1. Should the TCF abandon its current two track system of Topic 1 and Topic 2 and if so what should be adopted in its place?
2. Should the TCF set specific goals for how far technology maturity should advance for TCF projects? If so, what might those goals look like?
3. TCF currently accepts proposals from across the applied energy technology spectrum. Should TCF direct calls in the future around more specific topics or technologies shared across a range of energy areas e.g. batteries; heat transfer fluids. If so, who should determine these topic areas, and how?
4. Are time frames (6-12 months and 12-24 months, respectively) for Topic 1 and Topic 2 projects appropriate for their expectations?

Partners

5. Should TCF require all projects to identify partners who have expressed a legitimate desire to commercialize a specific technology, even if a project is what currently is designated a Topic 1 or lab only project?
6. The TCF is open only to DOE facilities as an eligible entity, however there is an expectation/requirement that they involve private sector partners (depending on the current Topic1/2 configuration). Currently, a DOE facility writes and submits TCF proposals. Should TCF expect or require partners to have a more active role in the development of TCF projects? Should this go so far as to expect the lab and partner to jointly develop a proposal? Should the TCF expect/require CRADA or other partnership agreement negotiations to have commenced before allowing a TCF proposal? If so, how?
7. The default partnership agreement for TCF projects is a CRADA. Are there other types of partnership agreements that are more aligned with the goals of the TCF, and would

facilitate strong commercialization relationships between DOE facilities and partners if were available?

Non-Federal Matching Funds

8. Should the TCF adjust its funding amounts of $100k-$150K and $250K-$750K and if so, what are appropriate funding amounts. Please recognize that this question assumes the 50-50 matching requirement is in place, so total project amounts are double to above amounts. Please justify any suggested funding changes. Does the current 50-50 cost-share requirement unduly affect the development of viable TCF proposals and or partnerships? Should TCF implement a graduated cost share amount based on the level of technology maturity and the availability of a partner?
9. TCF currently requires partners bring matching, non-federal funding through some form of direct contribution from the partner or the lab contractors in the case of a current Topic 1. Are there other mechanisms or methods used by government agencies and corporations that could attract additional matching funds to the TCF?

Potential to Leverage Other DOE Programs

10. Can TCF gain leverage by integrating or interacting with Energy I-Corps, which aims to accelerate the deployment of energy technologies by granting DOE laboratory scientists and engineers access to direct market feedback? If so, how would OTT pursue this integration or interaction?
11. Can TCF gain leverage by integrating or interacting with other Tech 2 Market programs and activities, which aim to eliminate common barriers like the lack of market readiness and resources access that prevent market exploration of new technologies? If so, how would TCF pursue this integration or interaction?
12. Can TCF gain leverage by integrating or interacting with SBIR, which encourages domestic small businesses to engage R&D that has potential for commercialization through awards-based incentives? If so, how would TCF pursue this integration or interaction?
13. DOE is pursuing an IP bundling effort with a group of labs, like in the Lab-Bridge-IP Bundling Project. The project created bundled technology solutions and proposed a multi-lab agreement mechanism to initiate timely access to IP packages, thus presenting a larger value proposition to potential industry partners than single lab searches. Should the TCF focus any efforts around supporting IP bundling type projects or other efforts that may involve similar technologies across multiple DOE facilities?