

2018 Focused Solicitation

Request for Proposals (RFP)

Issued: June 11, 2018

White Paper Responses Due Date: July 9, 2018

Full Proposals Due Date: August 20, 2018

1. SEMI-FlexTech Mission/Objectives

SEMI-FlexTech is an industry-led, public/private partnership providing a common platform for flexible hybrid electronics (FHE) manufacturers/developers and their supplier base to develop the next generation of manufacturing equipment and materials. FlexTech's mission is to help develop the infrastructure required to support world-class manufacturing capability for FHE devices and products through a focused R&D program. FlexTech will oversee and administer funds provided by the U.S. Government through the Army Research Laboratory (ARL) for this purpose.

Topics in this 2018 Focused Solicitation are advanced heterogeneous packaging for FHE (not assembly) and power, including integrated systems, system architecture and design, and integrated components such as batteries, supercapacitors, and energy harvesting. Concept demonstrations (demos) must be part of the deliverables for consideration of an award.

2. Proposal Process and Topics

The 2018 RFP is a focused solicitation which means responses must align to the topics stated in this RFP. Further description can be found in the Focused Solicitation section.

The proposal process will start with a white paper submission. Members of the FlexTech technical council will review the white papers and recommend those for full proposal submission. Point of contact for the submission will be invited to submit a full proposal. Full proposals will be evaluated by members of the FlexTech technical council based on a set of criteria that include budget, collaboration value, criticality of the problem addressed, relevance to the FHE ecosystem, schedule & milestones, deliverables, and overall proposal quality. White paper and full proposal content requirements are listed in sections 6 and 7. Typical FlexTech programs run from 9-18 months including a final report. No information considered to be company proprietary should be divulged.

In soliciting these proposals, FlexTech plans to grant and administer funding which should be matched (50% of total project cost requested) with funds in the form of cash and in-kind contributions provided by the grant recipients to cover the total project cost. If all other criteria are equal, preference will be given to proposals with a higher percentage of cost share. It should be noted that, historically, cost share for the ARL/FlexTech development program has averaged over 60% industry funding. Project Teams of skilled technical resources from FlexTech member companies will be identified to provide project oversight and direction. These Project Teams typically will be comprised of 2 to 4 experts from the consortium companies and members from the successful individual supplier or supplier team.

In responding to this solicitation, partnering among industrial companies or industrial company/ R&D organization/university teams is appropriate and in some cases encouraged. Individual company responses are appropriate where company size, breadth and expertise are sufficient to cover effectively all areas (e.g., technical resources, financial stability, and market presence) critical to the successful completion of the proposal.

FlexTech will support technical approaches that are revolutionary, thus having a more significant element of risk, as well as approaches that are evolutionary improvements upon existing capability, which tend to be less risky and involve shorter development and delivery intervals. It is recognized that it may be desirable to include information that is considered confidential and proprietary by the submitter in order to fully and effectively convey the technical merits of the proposal. While a best effort will be made to restrict the proposal information to those with a need to know expressly for purposes of the review, it is recommended that the inclusion of proprietary information be limited to the minimum necessary to convey the highlights of the technical approach.

With respect to intellectual property developed under a FlexTech contract, the following policy has been established to encourage suppliers to cooperate with FlexTech and ARL in the accomplishment of their objectives:

“Legal title to any technology developed under a FlexTech funded research and development contract will be the property of the development partner.”

Development agreements generally will be awarded on an actual cost basis, not-to exceed contracts, with payments to be made quarterly and based on milestones as presented in the proposal. If your company has a U.S. government approved rate structure, use it. If not, the normal commercial cost accounting system used for internal R&D projects will be acceptable. The methods used to value “cost sharing” cost must be the same as those used to value the full project costs. All suppliers are expected to have a government approved or industry standard accounting system by which actual project costs are tracked and reported. This is an absolute requirement to be sure that cost share obligations are met.

A work breakdown structure should be the basis of project schedules, milestone definitions, and cost estimates. Cost estimates for each major step leading to completion of a milestone should be used as the basis for the amount from the grant to be paid. A spreadsheet showing these calculations should accompany each proposal. The same spreadsheet should also show the specifics of how you will contribute your matching share of the total costs of the development contract. Cost sharing expectations have been established in the master agreement between FlexTech and ARL, and a minimum 50/50 cost sharing ratio between government and industry is required.

3. Research and Development Award Budget

FlexTech prior solicitations have resulted in awards in the budgetary range of \$250k-\$500k, with an additional cost share from the award recipient matching or exceeding the cash award. Anticipation for this 2018 RFP solicitation is a cash budget range of \$250k - \$1M with an additional matching (or greater) cost share from the award recipient. Proposals may be from single institutions or a project team comprised of various companies and/or universities. Proposals from multi-institutional teams will be preferred.

4. Focused Solicitation

In partnership with Army Research Labs, FlexTech is soliciting dual-use technology development proposals utilizing FHE sensors, power and other key electronic components. Consequently, topics of interest to this focused solicitation are those gaining prominence in commercial applications, i.e., advanced lightweight integrated systems applicable to cross-functional uses. One conceptual topic is a technology demonstration of positional navigation sensors and related electronics applicable to drone / ground vehicle combat systems that have a dual-use commercial application in fleet vehicle or autonomous automotive applications. A second conceptual demonstration could be sensors and communications systems integrated into drone platforms with unique and enabling form factors suitable for commercial and defense purposes. FHE technical programs demonstrating innovation in positional navigation sensors and electronic systems, 3D additive integrated electronics that could be built into unmanned air vehicle architectures and structures, or closed-loop self-powered location and communication for lightweight autonomous air and ground systems would be appropriate for this solicitation. Further detail associated with technical areas of interest include:

Part A – Heterogeneous Packaging for FHE - The purpose of this focused solicitation is to fund a recipient, a single team or multiple recipients and teams to conduct a R&D effort to develop advanced packaging technologies for breakthrough integration of semiconducting and passive components into flexible systems. It may include additive techniques to improve signal and power integrity. It may be methods of integrating a heterogeneous set of components for very high performance such as FOWLP, 2.5D, and 3D approaches for flexible electronics. System level packaging or system in a package utilizing advanced materials and processes that simplify hybrid integration with flexible electronics would be of consideration. Methods to enable high performance semiconductor functionality without increasing the number of surface mount components hindering the flexibility of the FHE device are of interest.

Part B – Power - The purpose of this focused solicitation is to fund a recipient, a single team or multiple recipients and teams to conduct a R&D effort to develop renewable, sustainable power systems for application to flexible hybrid electronics. Here power system solutions and demonstration of FHE integration is emphasized over single component development. FHE power system design, simulation, and optimization tools are also of interest as well as the development of ultra-low power circuits and components. Lightweight, flexible, efficient systems may include one or more energy harvesting transduction methods. And breakthrough materials applications to power delivery and management will be considered.

Part C – Open concept that builds upon the conceptual topics of sensor and navigational systems enabling unmanned aircraft systems and ground control/communication as described previously.

5. Requirements for Receiving an Award

In order to submit a response to this FlexTech RFP and subsequently to be considered for an award, several requirements must be met as detailed below.

- To receive an award from FlexTech, the company or composite team of companies must have a significant presence in the United States in the form of R&D activities and/or manufacturing. At least 50% of the work activity (funds) must be spent within the U.S. operations. The primary company leading the proposal must be a U.S.-owned company. Further, for the period of award

performance plus the 3 years following, the primary company plus all IP resulting from said award must remain under control of a U.S.-owned or majority controlled company. In certain cases, where it can be demonstrated that the development is both critical to U.S. manufacturing capability and unique, this “preference for U.S. operations” requirement can be waived with ARL approval. Any responding company requiring such a waiver must make this known in the pre-proposal document.

- The company or companies must be committed to volume manufacturing of the developed products and provision to the U.S. FHE industry on a right-of-first acceptance basis. Applied research conducted by universities will be considered and does not need to meet this requirement. However, in this latter case a pathway to commercialization and or licensing must be envisioned and described.
- The company or companies, including universities, must provide a matching share of the development cost in cash and in-kind contributions (e.g., labor and materials) - 50% recommended.
- Companies and organizations which are selected for an award, including all partners and/or subcontractors, must subsequently join SEMI at the appropriate membership level. Membership information is available at <http://www.semi.org/en/become-member-join-semi>
- Companies and organizations which are selected for an award, including all partners and/or subcontractors, must agree to terms and conditions set forth in the SEMI FlexTech Development Agreement before receiving any portion of the award.

6. White Paper Instructions

White paper submissions should be 5 pages (including any cover pages, tables of contents, figures, etc.) or less and contain a description of the proposed idea, high level budget, timeline, and background/experience of the R&D team. In addition, the submission should clearly outline the problem being addressed and how the proposed idea would solve the challenge. The current state of the art and the advancement the proposed idea has over that state of the art should be discussed. In addition, the value to the FHE ecosystem and potential path to commercialization should also be outlined. White paper submissions do not have to adhere to a specific format (other than maximum page length), but it may be useful to review the full proposal instructions in section 7 for suggested content.

White papers will only be accepted electronically up to 5:00 PM PT on the due date of July 9, 2018. Please submit your completed proposal via email to RFP2018@semi.org

7. Full Proposal Instructions

The format below will help us evaluate your proposal and ensure that the major topic areas are covered. A full proposal is typically 20 pages with a page limit of 35 pages.

Content: The proposal shall comply with the following content and structure.

Page 1: Cover Page

Date
Project Title

Company Name
Address

Project Leader Contact Information (telephone and email)
Project Team (Prime & Subs)
Project Duration

Total Project Cost
Cost Share
FlexTech Funds Requested

Page 2: Table of Contents

Page 3: Executive Summary, containing a short description of the project objective and industry or supply chain impact

Pages 4-35: Proposal Content

1. Project Proposal
 - 1.1. Problem definition
 - 1.2. Project scope and objectives
 - 1.3. Technical approach, rationale and innovative claims with supporting data and diagrams
 - 1.4. Performance target metrics and/or specifications
 - 1.5. Prior work, current status, and results (if any)
2. Statement of Work
 - 2.1. Project management approach
 - 2.1.1. Roles and relationships of key personnel and institutions
 - 2.1.2. Lead institution and subcontract partners
 - 2.2. Project schedule
 - 2.3. Detailed task description
 - 2.4. Milestones, deliverables including demonstration prototypes, reports, process definition, test results, reviews etc.
3. Detailed Project Cost and Cost Share by Task or by Quarter
 - 3.1. labor, materials, overhead, and capital
4. Project Risk Assessment
 - 4.1. Table: Analysis of Risk and Mitigation Strategy (list risk assessment tools/processes used if any)

Risk	Consequence	Mitigation Strategy	Impact (L,M,H)
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5. Market Needs and Competitive Landscape
 - 5.1. Business justification
 - 5.1.1. Existing product portfolio
 - 5.1.2. Primary markets served and major customers

- 5.2. Commercialization strategy for target markets
- 5.3. Cost of ownership benefits of proposed technology in absolute terms or relative to the cost of the typical current process

- 6. Company Background and Capability to Meet Technical and Business Targets
 - 6.1. Team & key personnel
 - 6.1.1. Management and technical personnel experience and qualifications
 - 6.2. Facilities and equipment
 - 6.3. Relevant company information
 - 6.3.1. Three year financial performance track
 - 6.3.2. Staff size and make-up by function
 - 6.3.3. IP strategy, key previous innovative developments and intellectual property (patents) held related to the proposal topic

- 7. Contact Information for Technical Lead, Alternative Technical Representative, and Contract Representative

- 8. Appendix (if needed - NOT INCLUDED IN PAGE TOTAL)
 - 8.1. Technical References
 - 8.2. Letters of Support

Full Proposals will only be accepted electronically up to 5:00 PM PDT on the due date of August 20, 2018. Please submit your completed proposal via email to RFP2018@semi.org

8. Proposal Evaluation

Upon receipt, proposals will be forwarded to the FlexTech Technical Council members for review. During the final selection process of proposals, some communication or negotiation between the potential supplier and representatives of FlexTech may be initiated over the terms, conditions, specifications, deliverables, schedule or other relevant factors contained in the proposal in advance of awarding of a contract. Granting of any awards to proposals submitted in response to this RFP is contingent upon the continued availability of funding from the U.S. Government.

9. 2018 RFP Schedule

The tentative schedule of activities for the FLEXTECH 2018 RFP is as follows:

June 11, 2018	RFP Issued
July 9, 2018	White Paper Due
July 23-25, 2018	Notification of White Paper Acceptance and Full Proposal Request
August 20, 2018	Full Proposals Due
September 24, 2018	Notification of Award (each full proposal point of contact will be notified)

RFP Schedule subject to change based on availability of review personnel, commitment of federal funds, and other factors.

10. Current Members of the FlexTech Governing and Technical Councils

Applied Materials	Cambridge Display Technology
DuPont Teijin Films	E Ink
EMD/Millipore	SEMI-FlexTech
FLEX (Flextronics)	Qualcomm
ThinFilm	US Army Research Laboratory
SmartKem	

11. Contact Information

Communication and questions during the proposal period should be directed to: Elizabeth Marzili, emarzili@semi.org or Dr. Melissa Grupen-Shemansky, megshemansky@semi.org