

Flexible Hybrid Electronics Manufacturing Innovation Institute

Questions and Answers

Proposers Day, 19 Feb 15

Arlington, VA

- 1) Q: FOA (page 2) says Proposals are due June 15. Page 17 says June 19. Which is correct?
 - A: An amendment to the FOA will be issued to clarify the due date. The formal request for a proposal will specify the due date, no later than 19 June 2015.
 - 2) Q: Which mail services are acceptable for submission? U.S. Mail? Registered? Return receipt? FedEx, etc.
 - A: FOA does not require a specific mail service. It is up to the offeror to decide which mail service to use to ensure a timely submission. Note in the presentation that U.S. Mail delivers to the building only twice a week.
 - 3) Q: We are seeking clarification on eligibility of the lead organization. Can a university serve in this role? Is a non-profit organization spun out of the university preferred over the university itself?
 - A: Yes to the first question.
 - A: The Government expresses no preference between a not for profit University and a separate not for profit organization to lead the Institute. However, if a University is proposed as a lead organization, the business plan must describe in detail how the Institute Management and Operations (FOA 3(A)(a) Pages 7-8) will establish and maintain a governance structure independent from University management and governing boards (e.g., Board of Trustees). The role of the Institute lead is to be completely impartial with respect to access and funding for all members, particularly during competition for project funding which would represent a potential Conflict of Interest (COI) if the University desired to perform Institute R&D. Universities should describe how they plan to establish an independent leadership team with the demonstrated experience and capability to engage government, industry and academia stakeholders, execute the industry-driven technical vision, establish the partnership model and manage the business integration strategy within a collaborative environment.
 - 4) Q: Five (5) institutes have been awarded. Of the 5, can you comment on the organizational model preferred?
 - A: The DoD will not comment on any preferred model. Each concept paper is asked to describe their management and operations, which should describe leadership, governance, and responsibilities based upon the vision of the FHE Institute. Each
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Institute is unique with different constraints and industry drivers and thus a single, preferred organizational model is not appropriate.

- 5) Q: When will the slides for Proposer's Day be available?
- A: The contracting overview charts will be posted the week after the West Coast Proposer Day. The other briefings will be posted to Manufacturing.gov and should be posted by COB 24 Feb 2015.
- 6) Q: Will this presentation (Eric's PM presentation) be available after this meeting?
- A: Yes, it will be posted on www.manufacturing.gov.
- 7) Q: Page 16 Para E states foreign participation will be on a case-by-case basis. Can partners (and cost share) come from non-US sources? That is, companies, trade groups.
- A: Page 16 of the FOA discusses five (5) key criteria for foreign entity participation as members in the Institute. Page 10 of the FOA discusses cost share. Any foreign cost share assumes foreign participation in the Institute.
- 8) Q: Are Rough Orders of Magnitude cost or firm pricing required for concept paper?
- A: According to Page 18, Para 2 (a) and Page 20, Para 2(f) of the FOA, the first step is a concept paper and a Rough Order of Magnitude (ROM) cost estimate. No detailed price or cost support information should be forwarded; only a time-phased bottom line figure should be provided.
- 9) Q: Compliance Matrix (page 26) refers to Section I.B., but that is a list of "reporting items". Is that the correct reference?
- A: On page 26, it should read: "As described in Section I." An amendment will be issued to remove the reference to Subsection B (paras 1-8).
- 10) Q: Is the \$75M already committed or subject to annual appropriations?
- A: The \$75M of estimated program funds as identified on Page 3 of the FOA is the anticipated Federal funding identified across five (5) fiscal years, each of which is subject to annual appropriations, as is all Federal funding. The complete funding for this Institute has been identified by program element within the President's FY16 Budget.
- 11) Q: The FOA lists two dates for the full proposal. Please clarify the actual due date.
- A: The full proposals must be received by 2:00PM EST on 19 June 2015. Invitations for full proposals are expected to be sent by 28 April 2015. An amendment to the FOA will be posted to clarify the due date for full proposals.

12) Q: If the Institute were to do a CRADA with a DoD research lab, could the funds to support the Institute's work be supplied by the Institute's contract? Should the proposal include CRADA ideas?

- A: Yes to both questions, if appropriate to the vision of the FHEMII as described in the Concept paper.

13) Q: Why are FFRDCs not allowed to prime this FOA?

- A: FFRDCs are not allowed to prime an Institute because they are not uniquely capable of serving this function without competing with the private sector.

14) Q: Why may labs not participate until award?

- A: FFRDCs are a national resource, and as such, should not be available to one team without being available to all teams. For that reason, it is best that they team post-award with the ultimate selectee/awardee for the Institute.

15) Q: Will the FHE-MII get separate and designated funds from the Federal government? Or will it be from the existing budget plans of multiple agencies such as NSF, DoD?

- A: The Institute funding is provided through the Defense Manufacturing Science and Technology Program element. Subject to Federal appropriations each fiscal year, funding spans FY15-FY19. R&D funds allow 2 years for obligation.

16) Q: Can one university participate in more than one team?

- A: Yes, members can team on more than one proposal.

17) Q: Can teams evolve from concept to full proposal?

- A: Yes.

18) Q: What types of cost share are allowed? E.g., time, equipment?

- A: Page 15 of FOA states all allowed cost share – State and local funding (not originating from Federal funds), private sector, cash, third party such as equipment facility and manpower.

19) Q: Box 1 on the screen: Is this the IMC? If it is more than the IMC, then what is in Box 3?

- A: IMCs are defined on Page 4 of Appendix.
- A: Box 1 is the Institute Business Structure to include IMCs, Partners and Projects. Box 3 contains elements not specifically funded by FHE-MII, either completely or partially.

20) Q: What is the essential envisioned difference or differences between Consortium and Institute?

- A: Essential difference between “Consortium” and “Institute”: For these purposes and this discussion, “consortium” is limited to the notion or concept of an alliance among organizations of similar type and interest. The concept of “institute” embodies an elegantly integrated public-private partnership that exercises core functions of advanced manufacturing technology R&D, related roadmapping, and workforce development and training to create an end-to-end innovation ecosystem, with both regional and national impact as part of a broad national network. In short, an IMI embodies much more than a typical consortium.

21) Q: The appendix suggests that roll-to-roll (RTR) technology is early stage (TRL4 and below). While this may be true when viewed in the context of the manufacture of a fully integrated device, it is not true for the progression of manufacturing steps towards a finished device, now or in the future. Examples include deposition of barrier or other functional device layers, printing of electronics and antennae, embossing of microfluidics and RTR pick and place of Si chips. One could anticipate that industry will employ an increasing number of sequenced RTR process steps prior to sectioning the continuous web into sheets for finishing in batch, pane- and/or plate-based steps. One role of the FHI would be to incorporate existing and emerging RTR processes into an overall manufacturing strategy as they become mature. As a purely plate /batched strategy will likely not be cost competitive. Please comment on how this view fits with the FHE vision.

- A: While use of RTR process for entire flexible electronics system processing are viewed as at low TRL/MRL, certain aspects of RTR processing can be considered as a part of manufacturing approach, if these are at corresponding MRL and within overall scope of the technical approach with intent of integration with other manufacturing technologies.
- From the FOA: “A proposed Institute that develops processes and technologies applicable within the current U.S. industrial base but which could subsequently transition to a future roll-to-roll commercial activity would meet the FHE-MII tenets.”

22) Q: Why require platform demos to be pre-competitive? This will discourage participation of Small and Medium Enterprises (SME). On the top level architecture chart, the term “within the Institute” is used. Does this mean “within the brick-and-mortar IMC facility”?

- A: Platform demos could potentially be pre-competitive or competitive depending on funding source. It is expected that core institute funds will be used for pre-competitive demos to ensure broad applicability.
- A: “Within the Institute” is intended to include activities both within the Innovation Manufacturing Centers and through project calls and workforce development.

23) Q: There is substantial evidence of some printed electronics being at MRL >4. Can you explain your comment that they are MRL/TRL <4? Do you mean all printed electronic systems or printed devices?

- A: Flexible hybrid device manufacturing focuses on integrating disparate component technologies, which could include printing electronics where appropriate. RFI responses indicated that completely printed electronic systems including logic, communications, sensors, and power are at TRL/MRL <4.
- A: Per FOA business plan operational structure: “Address a vision for the operation structure to integrate pre-MRL 4/TRL 4 programs into the Institute but not funded by the core DoD Institute investments”. Some technologies may reach this threshold after the inception of the Institute and then be included in Institute projects at that time.

24) Q: Do your comments about printed electronics imply that printed electronic materials have no role in Flexible Hybrid Electronics because they are ALL at TRL/MRL <4 today.

- A: Depending on the specific technology/application, printed electronic materials could have a role within the broader context of creating hybrid, packaged systems. The comment was intended to call out that the Institute is not expected to focus solely or significantly on printed electronics, but to assess performance of disparate technologies and develop manufacturing techniques to integrate them into a functional packaged device.

25) Q: What are the preferred or expected technical concentration areas of IMI? Detailed application opportunities - i.e., wearable vital signs sensor - from soup to nuts (AKA: design to mid-scale volume?) Major areas of manufacturing limits - i.e., thermally conductive, long-lasting adhesives – roll-to-roll large format inkjet techniques, etc. Presentation seems to go back and forth between applications vs. manufacturing issues/concerns for the technology.

- A: The FOA is not prescriptive. The Institute will be a Public Private Partnership with industry, academia, and government membership, and the vision of the Institute will need to define the technical concentration areas. The FHE Institute is intended to develop manufacturability in context with applications.

26) Q: What about the functionalities required for the flexible substrates? For example, how to provide power to run the electronics. Does it come under this Institute?

- A: Functionality of FHE devices depends on the application. Appendix A provides example Technology Platform Demonstrators, each of which have common and unique functionality.
- A: Power is an example of functionality that could fall within the Institute with respect to developing a manufacturing technologies processes necessary to integrate and design for power subsystem needs.

27) Q: Does the DoD have definitions of general tools versus specialty tools?

- A: The DoD does not have a unique definition. Industry used the following representative definitions: general tools reflect a broad set of equipment and processes used in the production of electronics, while specialty tools include equipment of specialized nature whose application is limited to a particular item or process required for flexible hybrid electronics.

28) Q: Since Roll-to-Roll and Printed Electronics are going to be viewed skeptically due to low MRL, shall the integration of flexible materials use existing foundry tools? Or include development of new tools or hardware to easily integrate FHI into existing infrastructure?

- A: With the goal of establishing stable, reproducible manufacturing techniques for integration of disparate components within 5 years, the use and modification of existing tools offer advantages. Limitations of such techniques focus assessment of emerging approaches that the Institute could mature from TRL/MRL <4.

29) Q: Does the Institute have its own shared-user facilities (i.e., its own clean room and equipment)? Can the Institute manage the use and access to distributed lab facilities that exist at its partners' sites?

- A: The Institute is expected to have a form of user facilities; however, the location and distribution of those facilities should be a central part of the vision and adequately described in the concept paper. Leveraging vs. owning some shared user facilities is acceptable. Integrated process development is viewed as important. A distributed model should address how manufacturing will be developed and what the natural boundaries are for a distributed model. What is critical for the institute is member access to an end-to-end capability within the Institute, for manufacturing development, demonstrations, and workforce education and training.

30) Q: Does DoD have any specific vision of IMCs - makeup, number, location, current usage?

- A: No. We are looking to share knowledge, and infrastructure to create an industrial commons.

31) Q: Does the FHE envision the risk reduction of regulatory and environmental risk as a part of its goals or scope (materials related)?

- A: The technical approach should consider regulatory and environmental issues.

32) Are developments of scale-up of thin film barrier materials envisioned to be in-scope for FHE?

- A: Scale-up of thin film barrier materials could be within the scope of the Institute.

33) Q: Are FHEs inclusive of all electronic technologies; i.e., silicon (CMOS) compound semiconductors and thin film semi-conductors (TFTs) or only intended for a specific technology? If it is the latter, what is or are the preferred technologies?

- A: As discussed in the FOA, a major focus of the Institute will be to integrate disparate, hybrid technologies into a flexible package. The types of technologies to be integrated will depend on the application and it is not intended for one specific technology.

34) Q: During review of concept papers, do you ever suggest two (2) projects should be combined?

- A: We assume the question infers that 2 concept paper proposers would be recommended by the government to team. While reteaming is encouraged, it is not the Government's responsibility to suggest any reteaming as this would interfere with the competitive process.

35) Q: What happens during the site visit?

- A: Well-defined day at the Institute, physical infrastructure or HQ to understand the vision, facilities and membership contingencies. In some cases, the cost share proposed may have constraints or contingencies which specifically influence the Institute's vision, operational structure, or facility planning. The site visits will allow the source selection authority to understand the proposed operational and facility plans.
 - i) Business plan overview, with sustainability plans and cost sharing contingencies.
 - ii) Tour or view physical infrastructure
 - iii) The site visit at a physical structure does not necessarily need to visit a HQ if HQ will be at a different location