



Lawrence Livermore National Laboratory
Supply Chain Management Department

March 29, 2012

**Subject: Request for Proposal (RFP) Number B599858
Memory Research & Development**

Proposal Due Date: May 11, 2012

Lawrence Livermore National Security, LLC (hereinafter called "LLNS") requests a proposal for Extreme-Scale Computing Research and Development (hereinafter called "FastForward") for Memory in accordance with this RFP and the enclosed Sample Subcontract.

This RFP letter and all of its associated documents may be downloaded from the following URL. This web site also contains links to other related web sites and a question and answer section.

<https://asc.llnl.gov/fastforward/>

LLNS is representing seven DOE Laboratories and the DOE as the Source Selection Official for this RFP. See the attached Statement of Work (SOW) for a list of the Laboratories and DOE offices participating in FastForward.

The LLNS Contract Administrator is Brandt Esser and may be reached by telephone at (925) 423-1518 or by e-mail at esser3@llnl.gov.

The Lawrence Livermore National Laboratory (hereinafter called "LLNL") is managed by LLNS and operates under LLNS procurement policies and procedures consistent with the Prime Contract between LLNS and the United States Government, represented by the Department of Energy National Nuclear Security Administration (hereinafter called "DOE/NNSA").

PROPOSAL DUE DATE

LLNS will not extend the proposal due date shown above. FastForward is on a strict schedule. Its goals do not allow any change to the proposal due date. Proposals shall be valid for at least 60 days after the due date. Acceptance of late proposals will be at the sole discretion of LLNS.

RFP CONDITIONS

LLNS reserves the right to reject any or all proposals, to waive any minor irregularities in any proposal, or to cancel this RFP at any time prior to award without cost to LLNS. This RFP does not include provisions for the direct reimbursement of proposal preparation costs.

AWARD STRATEGY

LLNS desires to select two Offerors for each area of technology discussed in the Attachments to the SOW. However, LLNS reserves the right, based on the proposals received in response to the RFP, to

select none, one, or more than two for any area of technology. LLNS reserves its rights to: 1) make selections on the basis of initial proposals; 2) negotiate with any or all Offerors for any reason; and 3) award subcontract(s) based on a single proposal that addresses more than one area of technology. See the SOW for additional information.

FASTFORWARD SCHEDULE

Proposal evaluation and source selection will commence immediately after receipt of proposals. LLNS will select finalists by June 1, 2012, and will notify finalists of their selection by June 4, 2012. At that time, negotiating teams, consisting of select members from the DOE Laboratories, will engage the finalists in negotiations to finalize the statements of work, milestones, price, and any other provisions, as required. Negotiations must be complete by June 15, 2012. Therefore, it is imperative that the Offerors selected for negotiation have qualified and authorized personnel available during the first two weeks of June to negotiate with the Laboratories' negotiating teams. The schedule calls for LLNS to award subcontracts by June 29, 2012. Each subcontract will have a two year period of performance.

INTELLECTUAL PROPERTY

It is anticipated that DOE will grant a class advance waiver on intellectual property for FastForward. The grant of this class advance waiver is anticipated shortly. Upon receipt of the explicit language of the waiver, LLNS will amend this RFP and update Attachment 8 on the Extreme-Scale Computing web site. In general, the waiver will allow an awardee that is a large business, and any first tier subcontractor of that awardee, to assert copyright to its works of authorship and to elect title to its subject inventions without prior approval from the Government.

Cost sharing is a condition of the class advance waiver for a large business awardee. A large business must fund at least 40% of the total price of performance under its subcontract to have the class advance waiver language included in that subcontract. All Offerors shall include the total price of performance in their proposals and Offerors that are large businesses must make a specific assertion accepting the 40% share (or offering to share more than 40%) in order to obtain the terms of the class advance waiver. Offerors that are large businesses, that do not accept the 40% share, and that may be selected for award will be subject to the existing FAR and DEAR intellectual property clauses in the GENERAL PROVISIONS incorporated in the Sample Subcontract.

A large business Offeror that desires a lower cost share percentage or different terms than those granted in the class advance waiver would be required to negotiate directly with DOE. However, those negotiations would be time consuming and would not allow the DOE Laboratories to maintain the FastForward schedule. As a result, the DOE Laboratories may view the Offeror's proposal less favorably than a proposal from another Offeror that is willing to cost share at least 40% and accept the class advance waiver provisions as is.

Offerors that are small businesses or non-profit entities and that may be selected for award should note that the class advance waiver provisions for patents will not be included in a subcontract. By statute, a small business may elect title to its subject invention without prior approval from the Government.

Foreign owned or controlled Offerors and proposed foreign owned or controlled subcontractors to an Offeror at any tier are not eligible to receive the class advance waiver provisions. These entities will be subject to the existing FAR and DEAR intellectual property clauses in the GENERAL PROVISIONS incorporated in the Sample Subcontract.

FUNDING AND AVAILABILITY

LLNS intends to fund each subcontract annually in more or less equal amounts. Offerors must structure their proposals, work efforts, milestones, etc., to reflect approximately equal funding for each of the two performance years. Proposals that do not demonstrate funding balance may not be viewed favorably compared to others that do.

The number and value of awards in each area of technology will depend upon the proposals received and their relative value overall as noted above in AWARD STRATEGY and below in EVALUATION AND SELECTION. That is, the DOE Laboratories have not allocated one-third of the total funding to each technology area. The DOE Laboratories reserve the right to allocate funding to a technology area based on the relative value of the proposals received in all areas of technology.

AWARD VALUE

The DOE Laboratories have established a \$20M threshold for the value of any subcontract awarded as a result of this RFP. An award in excess of \$20M would require additional reviews and not allow the DOE Laboratories to meet the schedule. The DOE Laboratories will not view favorably a proposal with a DOE cost share value¹ in excess of \$20M.

Further, since the ideal would be two awards in each technology area and because there is limited funding for these awards, the DOE Laboratories may view a proposal with a value of, for instance, approximately \$10M more favorably than a proposal nearing the \$20M threshold unless the latter proposal is compelling in the way it addresses a FastForward technology area.

NAICS CODE AND SMALL BUSINESS SIZE STANDARD

The North American Industry Classification System (NAICS) Code for this acquisition is 541712, Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology). The corresponding small business size standard for this acquisition is 500 employees.

The Offeror shall base its Small Business Program Representations in the attached Representations and Certifications form on this small business size standard. Refer to Subpart 19.1 - Size Standards of the Federal Acquisition Regulation (FAR) for information on calculating annual average gross revenue.

The DOE Laboratories welcome proposals from small businesses and encourage small businesses to engage in FastForward.

¹ Offerors must be aware of the following. As discussed in INTELLECTUAL PROPERTY above, a \$25M proposal from a large business that accepts the 40% cost share would result in a DOE cost share value of \$15M, which is under the threshold.

PROPOSAL CONTENTS

Common Mandatory Requirements

The Offeror's proposal shall demonstrate its ability to meet or exceed each of the common mandatory requirements identified in section 7 of the SOW. The common mandatory requirements for a proposal apply regardless of the technology area or areas addressed in a proposal. These are noted below by section title.

- Solution Description
- R&D Plan
- Productization Strategy
- Staffing/Partnering Plan
- Project Management Methodology
- Intellectual Property Plan

Technology-Specific Mandatory Requirements

The Offeror's proposal shall estimate or quantify the impact of the proposed memory technology over industry roadmaps and trends. The proposal shall provide information for all of the Performance Metrics described in Attachment 2 to the Statement of Work. If any of the Performance Metrics are deemed not applicable to the technology being proposed, Offeror shall explain why it believes the metric is not relevant and shall specify an alternate, meaningful metric. See A2-3 in the SOW for additional details.

Performance Features and Supplier Attributes

The Offeror's proposal should identify and discuss the performance features and supplier attributes that will be important to the Offeror's successful performance and the attainment of FastForward's objectives. The DOE Laboratories have identified the performance features and supplier attributes listed below, which should be discussed in the proposal. The Offeror may identify and discuss other performance features and supplier attributes it believes may be of value to the DOE Laboratories. If the DOE Laboratories agree, consideration may be given to them in the evaluation process. In all cases, the DOE Laboratories will assess the value of each proposal as submitted.

Performance Features

- The extent to which the proposed solution meets the overall programmatic objectives expressed in the SOW.
- The number and type of TRs proposed and the degree to which the technical proposal meets or exceeds those TRs.
- The degree of innovation in the proposed R&D activities.
- The extent to which the proposed R&D achieves substantial gains over existing industry roadmaps and trends.
- The extent to which the proposed R&D will impact HPC and the broader marketplace.
- Credibility that the proposed R&D will achieve stated results.
- Credibility of the productization plan for the proposed technology.
- Realism and completeness of the project work breakdown structure.

- The extent to which the proposed technology will reduce the energy per bit consumed over current DRAM, NVRAM or alternative memory designs while improving capacity, bandwidth and resilience
- The extent to which the proposed technology will increase memory bandwidth while keeping cost, reliability and power consumption under control
- The extent to which the proposed technology can deliver both bandwidth and capacity in the same cost effective package
- The extent to which the proposed technology reduces component failures over a baseline that is largely set by smaller scale consumer devices
- The extent to which the proposed technology improves and scales the ability to detect and correct transient errors, and to prevent the incidence of silent errors in large-scale systems
- The extent to which the proposed technology is able to embed processing in memory to improve data transfer efficiency, more deeply integrate NVRAM in the memory hierarchy or to simplify the management of deep memory hierarchies

Supplier Attributes

- The extent to which the proposal demonstrates the Offeror's experience and past performance engaging in similar R&D activities
- The extent to which the Offeror demonstrates its ability to meet schedule and delivery promises
- The extent to which the proposed research aligns with the Offeror's product strategy
- The extent to which the proposal demonstrates significant relevant expertise and skill of the Offeror's key personnel
- The extent to which the proposal demonstrates the contribution of the Offeror's management plan and key personnel to successful and timely completion of the work
- The Offeror should include in its proposal a written description of contracts similar in type and complexity as this scope of work that the Offeror has completed recently. These may include public and private contracts. Include technical and business contact points by name, title, address, telephone number and, if available, e-mail address. Offerors should include a self-assessment of their performance on these contracts including what went well and what did not. Offerors should discuss the latter in the context of a lessons learned scenario. The Offeror should also identify, and provide resumes for, key personnel who will perform the work.

Price

The price proposal shall include a total firm fixed price for the work described in the Sample Subcontract and the SOW. The proposal shall include a basis of estimate (BOE) for the proposed total firm fixed price and milestone payments and deliverables. The BOE shall include, at a minimum, an estimate of labor categories, labor hours by category, and fully burdened hourly labor rates by category to perform the work. The BOE shall also identify proposed material, travel, or other expenses to perform each proposed activity or task. The proposal shall include a projected funding expenditure profile by month or quarter for each proposed research activity or task. LLNS does not anticipate the need for Certified Cost or Pricing Data (as defined at FAR Part 15); however, LLNS reserves its right to request submission of Certified Cost or Pricing Data from the selected Offeror(s).

Offerors should propose milestone payments and/or payments for deliverables. Milestone payments must conform to the following guidelines.

- A milestone payment cannot represent an advance payment. It must represent the value the DOE Laboratories will receive upon making the payment.
- A milestone payment must be in accordance with readily verifiable actions or achievements (e.g., receipt of purchased materials, measurable performance, or a report on accomplishments).
- The final milestone payment must be at least 10% of the total subcontract price.

The proposal shall include invoice payment terms. LLNS prefers payment terms of 2% 15, Net 30 Days.

The price proposal shall be separate and distinct from the technical proposal content. While this part of the proposal may consist of more than one file, the files shall not contain any technical responses to the SOW other than references to corresponding milestones or deliverables. See Submittal of Proposals below.

Financial Statements

The successful Offeror must have sufficient financial resources to perform the subcontract. LLNS reserves the right to request adequate evidence to determine an Offeror's financial condition. The evidence would consist of either: (1) audited and certified year-end financial statements for a minimum of the last two years (balance sheet, income statement, statement of cash flows, and other financial statements or reports as necessary); (2) financial statements reviewed or compiled by a certified public accountant or other accounting professional (include the accounting firm's cover letter); or (3) other information acceptable to LLNS. LLNS reserves the right to request additional financial statements.

Small Business Subcontracting Plan

Unless the Offeror is a small business or the total value of the offer is less than \$650,000, the successful Offeror must provide a Small Business Subcontracting Plan that includes anticipated total subcontracting amount and the percentage goals and amounts for all of the various small business categories. Refer to the *SMALL BUSINESS SUBCONTRACTING PLAN* clause referenced in the GENERAL PROVISIONS and the attached Model Small Business Subcontracting Plan for additional information. The approved plan will be made a part of any resulting subcontract. Failure to submit an acceptable subcontracting plan shall likely render the Offeror ineligible for award of a subcontract. If the nature of the proposed work is such that the Offeror will perform all the work and no opportunities exist for subcontracting with small businesses, then the Offeror should state so in its proposal.

Acceptance of Terms and Conditions

Submission of a proposal shall indicate the Offeror's willingness to accept the terms and conditions of the Sample Subcontract and its attachments unless specific exceptions are taken. These terms and conditions have been approved by the DOE/NNSA. Changing them may be time consuming. Failure to accept the terms and conditions could delay the FastForward schedule in award of a subcontract and could cause LLNS to reject an Offeror's proposal.

EVALUATION AND SELECTION

Evaluation Factors

Evaluation factors are mandatory requirements, performance features, supplier attributes, and price that the DOE Laboratories will use to evaluate proposals. The DOE Laboratories have identified the mandatory requirements, performance features and supplier attributes that should be discussed in the proposal. Offerors may identify and discuss other performance features and supplier attributes they believe may be of value to the DOE Laboratories. If the DOE Laboratories agree, consideration may be given to them in the evaluation process.

Basis for Selection

The DOE Laboratories' assessment of each proposal's evaluation factors will form the basis for selection. LLNS intends to select the responsive and responsible Offerors whose proposals contain the combination of price, performance features, and supplier attributes offering the best overall value to the DOE Laboratories. LLNS will determine the best overall value by comparing differences in performance features and supplier attributes offered with differences in price, striking the most advantageous balance between expected performance and the overall price. The DOE Laboratories will assess each Offeror's past performance in terms of the lessons learned provided by the Offeror and/or through interviews with the Offeror's customers. Offerors must, therefore, be persuasive in describing the value of their proposed performance features and supplier attributes in enhancing the likelihood of successful performance or otherwise best achieving the objectives for extreme-scale computing.

PROPOSAL INSTRUCTIONS

Offerors' Questions

The DOE Laboratories will respond to questions submitted in writing to the LLNS Contract Administrator on or before May 4, 2012. Questions may be submitted by letter or e-mail, with e-mail preferred. Answers to questions that are germane to the interpretation of FastForward requirements will be posted to the FastForward RFP web site for viewing by all potential Offerors.

Submittal of Proposals

The Offeror shall send its proposal to one of the following addresses. The proposal shall be in electronic form (Microsoft Office and/or portable document format files) on as many compact discs as necessary to contain the proposal. Proposals must be received no later than May 11, 2012.

Address for Commercial Courier

(Not For Hand Delivery)

Lawrence Livermore National Laboratory
Attention: Brandt Esser
Mail Code L-557
RFP B599858
7000 East Avenue
Livermore, CA 94550

Address for Mailing

Lawrence Livermore National Laboratory
Attention: Brandt Esser
Mail Code L-557
RFP B599858
P.O. Box 5012
Livermore, CA 94551

Proprietary Information

The DOE Laboratories will treat all commercial, financial or technical information that is properly marked in a proposal in response to this RFP as proprietary information; however, the DOE Laboratories prefer not to receive any proprietary information. Proper marking requires that each page containing commercial, financial or technical information be marked "Proprietary" or its equivalent.

The DOE Laboratories will use their best efforts to (1) maintain such proprietary information in confidence, giving it the same degree of care, but no less than a reasonable degree of care, as the DOE Laboratories exercise with their own proprietary information to prevent its unauthorized disclosure; and (2) only disclose such proprietary information to their employees, agents, consultants or subcontractors on a "need to know" basis. In addition to the above, the Offeror agrees that from time to time, consistent with the terms of the DOE Laboratories' prime contracts with the U.S. Government, the DOE Laboratories may release proprietary information to Government personnel who administer those prime contracts. Government personnel in receipt of proprietary information are subject to confidentiality requirements pursuant to 18 U.S.C. §1905.

Royalty Information

If the offer in response to this solicitation contains costs or charges for royalties totaling more than \$250, the following information shall be included in the response relating to each separate item of royalty or license fee: name and address of licensor; date of license agreement; patent numbers, patent application serial numbers, or other basis on which the royalty is payable; brief description, including any part or model numbers of each item or component on which the royalty is payable; percentage or dollar rate of royalty per unit; unit price of item; number of units; and total dollar amount of royalties.

In addition, if specifically requested by the LLNS Contract Administrator before award, the Offeror shall furnish a copy of the current license agreement and an identification of applicable claims of specific patents or other basis upon which the royalty may be payable.

E-Verify Program Enrollment Verification

The subcontract will include FAR Clause 52.222-54, *EMPLOYMENT ELIGIBILITY VERIFICATION*. Accordingly, the selected Offeror will be required to:

1. Be enrolled as a *Federal Contractor* in the Government's on-line E-Verify System, which is located at: <https://e-verify.uscis.gov/enroll>, and provide the LLNS Contract Administrator with written verification of the enrollment;
2. Use the E-Verify System to verify the employment eligibility of employees as required by the clause; and
3. Include the clause in lower-tier subcontracts for Services or Construction in accordance with paragraph (e) of the clause and ensure such lower-tier subcontractors enroll as a *Federal Contractor* in the E-Verify System.

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Additional information about employment eligibility verification requirements is available at: <http://www.dhs.gov/E-Verify>.

Sustainable Acquisition

The successful Offeror shall comply with all environmentally preferable purchasing provisions and reporting requirements.

ENCLOSURES

The following documents are hereby incorporated as part of this RFP and need not be returned with the proposal.

Sample Subcontract and its Incorporated Documents
Model Small Business Subcontracting Plan

The Offeror shall complete the following document(s) and submit it with the proposal.

Representations & Certifications

Sincerely,

Brandt Esser
LLNS Contract Administrator