National Laboratories Partner with U.S. Manufacturers to Increase Innovation and Energy Efficiency

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Today’s Agenda

9:00 am - 9:05 am PT Welcome and webinar instructions
9:05 am - 9:35 am PT Overview of program
9:35 am - 10:00 am PT Q&A

Participant instructions

► Please turn off video and mute your phone
► Questions will be answered at the end of the briefing
  ► Send to “Q&A” panel
HPC4EnergyInnovation umbrella
Summary - What is new this solicitation?

- This is a “normal” solicitation open to all companies
- This solicitation is not related to COVID19 per se. If you are interested, please visit COVID-19 High Performance Computing Consortium links at [www.covid19-hpc-consortium.org](http://www.covid19-hpc-consortium.org).
- Universities can be subcontractor to the DOE labs to add specialized industry-relevant expertise
- PLEASE review the budget requirements in the solicitation. For a $300K DOE contribution the industry contribution (cash and/or in-kind) should be $75K (total project funding $375K) for demonstration projects (more for follow-ons) Many full proposals still use the old $60K number.
The DOE National Laboratories have some of the largest computers in the world and significant technical expertise offering the benefits of HPC to U.S. Industry

- Accelerate innovation
- Optimize design
- Reduce testing cycles
- Shorten the time to market
- Quality processes
- Reduce waste/reduce rejected parts
- Lower energy costs
The HPC4 Program is building an ecosystem to support HPC adoption by industry/government

- Showing what is possible with HPC through demonstration projects
  - DOE program office funds < $300K to laboratories
  - Industry funds at least 20% of total project funding; either in-kind support or optional cash contribution
  - Project duration < one year

- Building the HPC4 community
  - Student intern programs
  - Webinars
Program Approach - Companies apply to program through a solicitation process

Engage industry

Industry submits challenges

Match challenge to PI

AMO approval; Feedback to industry

Sign agreements

Inform industry

Concept paper → Full proposal → Award

Technical Review Committee

Technical Merit Review Committee

• Partner labs and DOE representatives
• Heavy focus on nation-wide impact to energy efficiency and clean energy technology industry-wide
• $300K DOE funds Laboratory PIs
• 20% in-kind from industry partner
Program Details: Eligibility and Funding

- Eligibility for call
  - Companies manufacturing in the U.S.

- Who can be funded from the program
  - DOE National Laboratories
  - University collaborators can be funded by the industry partner or DOE National Laboratory
  - Encourage to partner with universities and non-profit organizations located in federally-designated Opportunity Zones and or/Historically Black Colleges and Universities (HBCU)

- Industry participant cost share
  - At least 20% of total project funding for new projects
  - At least 33.3% of total project funding for follow-on projects
  - Can be used to support internal staff
  - Source can not be other federal funding
Program Details: If Awarded DOE Model Short Form CRADA

- Used for accelerated placement and execution
- Scope and IP protection defined
- Industry awardees required to sign DOE Model Short Form CRADA
- Standard DOE Model Short Form CRADA available on the web site
  - Individual labs may have some variances
- If concept paper is selected to go forward; you can ask your laboratory partner for a copy of the specific CRADA

Required!
HPC4Manufacturing solicitation topics directly align with DOE’s Advanced Manufacturing Office goals to save energy

Broad impact on energy efficiency and/or productivity:
- Use HPC to overcome a key technical challenge
- Process optimization
- Advanced product design
- Predicting performance and failure rates
Concept papers are the first step:

- Two-pages; single spaced; 12 pt. font - Use the template at [https://hpc4energyinnovation.llnl.gov/solicitation-spring.html](https://hpc4energyinnovation.llnl.gov/solicitation-spring.html)
- Key Elements
  - Title page
  - Abstract (150 words or less) - must be a non-proprietary, publishable summary
  - Background
    - Technical challenge to be addressed
    - State of the art in manufacturing and how this work advances the state of the art
    - Why national laboratory expertise and HPC resources are needed
  - Project Plan and Objectives
    - Technical scope of the work and how this project fits into the overall solution strategy
    - How results will be validated including availability of data
    - Specific simulation codes that will be used if known
  - Impact
    - How this effort results in long-term energy savings or
    - Ability to accelerate innovative energy-efficient manufacturing
    - Metrics include cost savings, energy savings, and improvement in energy intensity

You do not need to identify a laboratory partner up front!
Just an interesting and difficult problem that HPC can help address!
Full proposals provide much more detail

- Six-pages; single spaced; 12 pt. font - Use the template at [https://hpc4energyinnovation.llnl.gov/solicitation-spring.html](https://hpc4energyinnovation.llnl.gov/solicitation-spring.html)

- **Key Elements**
  - Title page
  - Abstract (150 words or less) - must be non-proprietary, publishable summary
  - Background
    - Similar to concept paper
  - Project Plan and Objectives
    - Similar to but more detailed than concept paper with specific tasks; specific simulation codes; modifications to the software needed etc.
  - Tasks, Milestones, Deliverables and Schedules
    - Goals, timelines and due dates of milestones and deliverables from all partners, including who is the responsible party for each deliverable and what will be communicated between the partners
  - Verification and Validation Plan
    - How do you intend to validate the findings of the model
  - Impact
    - Similar to concept paper but more detailed; is this transformational for an industrial sector and how; what is the enduring impact; how will results be disseminated
  - Implementation
    - How will this be incorporated into company and industry-wide operations; and follow on activities to extend this effort to solve the broader problem being addressed
  - Various appendices (see next slide)
Appendices provide additional information

- Used in the review process; CRADA development process; compute resource determination, etc.
- Not included in the six-page limit
- **Appendix A**: References (not included in page count)
- **Appendix B**: Project summary of tasks and schedule (similar to project tasks in main proposal, but used for CRADA development)
- **Appendix C**: Project budget: costs, amount and source for participants, cost share (in-kind or cash); how funding makes a difference relative to existing funding
- **Appendix D**: Computational resources: computational approach, performance of the codes, resources requested (platform and core hours)
- **Appendix E**: Pictures for publication (Photos are used for program announcements)
- **Appendix F**: How the work benefits the laboratory
- **Appendix G**: Paragraphs biographies of industry and lab lead PIs
- **Appendix H**: Resumes of key participants
Success Stories

**GE**: larger, higher fidelity turbine design using advanced turbulence models

**ZoomEssence**: new food particle dryer configuration using advanced CFD

**Vitro Glass**: real time control of glass furnace using deep-learning tools

**P&G**: faster modeling of paper towel drying process using parallel computing
Industry interested in simulations at many levels

- New alloy design: Alcoa, Arconic, Carpenter
- Junction design: Samsung
- Membrane design for de-humidification air-conditioning: 7AC Technologies
- Catalyst design for lignin denature: APPTI (paper manufacture consortium)
- Microstructure for additive manufacture, casting, welding: GE, Eaton, UTRC, GM, Arconic, Flash Bainite, US AK Steel, ArcelorMittal
- Predict stress-strain curves for new material: LIFT
- Engine/turbine tolerancing: Ford, GE
- Turbine CFD: GE, Rolls Royce
- Semiconductor deposition: Applied Materials, SORAA
- Furnace design: Vitro Glass, ArcelorMittal, Owens Corning
New Proposal Application - Submit Paper Electronically!

Access the electronic proposal system at proposalshpc4.inl.gov or HPC4EI Solicitation website

Instructions available for download on the system’s Home page
New Electronic Proposal Application

Create account and complete general account information

Click here

Create User Account

Provide information
New Electronic Proposal Application

Proceed to Application tab to view Current Open Calls. Select “Create New Application”. Application form will appear in new window. Directions are displayed for each section.

Application must be saved before PI, Co-PIs, Proposal POC, and National Laboratory PIs sections can be populated. **Forms may be saved, revisited, and edited until the deadline.**
New Electronic Proposal Application - Upload Submission

Before uploading submission, ensure concept paper is formatted per provided Concept Paper Template.

Submission format: Single spaced pages using 12-point font (Times New Roman) and converted to a PDF file. Template instructional boxes should be removed from the document. A concept paper that does not meet the guidelines may be rejected for review.

Attachment Name | File Size | File Upload Date | Content Type
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No Concept Paper uploaded.

After completing and saving this form, the applicant may edit the saved version until Thursday, April 30, 2020 5:00 PM PT. To submit the proposal for final review, the applicant MUST click on the "Save and Submit" below. Forms in the system that are "Saved" but not "Submitted" are considered incomplete and will not be reviewed.

For assistance please contact Michelle Herawi at 925-423-4964 or hpc4ei-submissions@llnl.gov.

Contact the HPC4EI Proposal Helpdesk at hpc4ei-submissions@llnl.gov.
Notifications of review results are generated from the proposal system and addressed from hpc4ei-submissions@inl.gov. It is highly recommended to add the email address to contact list to avoid notification directing to spam.

Visit the Applications page to view proposal status and Technical Merit Review Committee comments.
Visit our website for solicitation details

DEADLINE EXTENDED  

Concept paper deadline is  
June 30, 2020 by 5:00 p.m. PT

Additional information at  www.hpc4energyinnovation.org


Questions can be sent to  hpc4ei@llnl.gov

Join the  hpc4ei-info@llnl.gov  distribution lists via the web to receive program announcements

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